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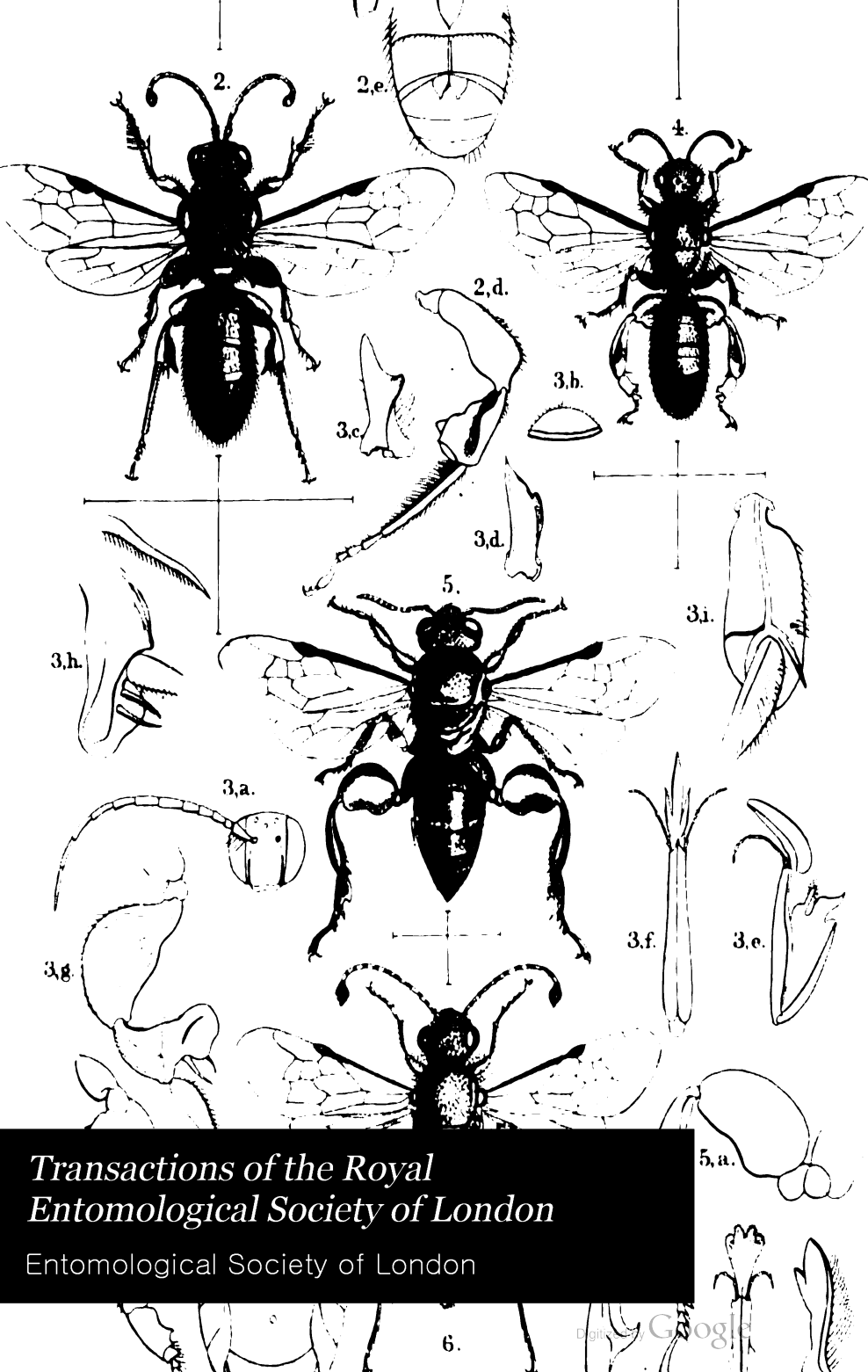

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ERRATA.

Page 11, line 1, et passim, for "Endomycici" read "Endomychici."

„ 138, line 20, for "Dr. Renton," read "Dr. Reuter."

„ 161, after line 22, insert "*Hab.*—Andaman Islands."

„ 228, line 11 (from the bottom), for Family "CANTHARIDÆ," read Family "ŒDEMERIDÆ."

„ xlvi. of Proceedings, line 12, for "Oxyuri," read "Oxyura.

Pl. VI. fig. 3. There should be only four joints in each of the hinder tarsi instead of five.

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1866	†	Salvin, Osbert, M.A., F.R.S., F.L.S., &c., 6, *Tenterden Street, Hanover Square*, W., and *Brookland Avenue, Cambridge.*
1865	†	Saunders, Edward, F.L.S., 2, *Spencer Park, Wandsworth*, S.W.
1861	†	Saunders, G. S., *Spencer Park, Wandsworth*, S.W.
•		Saunders, Sir Sidney Smith, C.M.G., PRESIDENT, *Rosenheim, Reigate.*
•	†	Saunders, William Wilson, F.R.S., F.L.S., &c., *Raystead, Worthing.*
1865		Schaufuss, L. W., Ph. D., M. Imp., L. C. Acad., &c., *Dresden.*
1875	†	Sealy, Alfred Forbes, *Cochin, South India.*
1864		Semper, George, *Altona.*
1862		Sharp, David, M.B., *Eccles, Thornhill, Dumfriesshire.*
1847		Shepherd, Edwin, 21, *Albert Terrace, Clapham Road*, S.W.
1851		Sheppard, Augustus F., *Rose Bank, Eltham Road, Lee*, S.E.
1852		Sheppard, Edward, F.L.S., 18, *Durham Villas, Kensington*, W.
1867		Sidebotham, Joseph, 19, *George Street, Manchester.*
1850		Smith, Frederick, 27, *Richmond Crescent, Islington*, N.
1869		Smith, Henley Grose, *Warnford Court, Throgmorton Street*, E.C.
•	†	Spence, W. B.

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Date of Election.		
1848	†	Stainton, Henry Tibbats, F.R.S., F.L.S., &c., *Mountsfield, Lewisham*, S.E.
1862		Stevens, John S., 88, *King Street, Covent Garden*, W.C.
1837		Stevens, Samuel, F.L.S., *Loanda, Beulah Hill, Upper Norwood*, S.E.
1866		Swanzy, Andrew, F.L.S., *Sevenoaks.*
1854	S.	Thompson, Miss Sophia, *Barn Hill, Stamford.*
1856		Thomson, James, 12, *Rue de Presbourg, Place de l'Etoile, Paris.*
1838		Thwaites, George Henry Kendrick, Ph. D., F.R.S., F.L.S., Director of the Royal Botanic Garden, *Peradenia, Ceylon.*
1853	S.	Tompkins, H., 28, *Tavistock Square*, W.C.
1859	†	Trimen, Roland, F.L.S., *Colonial Office, Cape Town, Cape of Good Hope.*
1874		Tuely, Nathaniel Clissold, *Mortimer Lodge, Wimbledon Park*, S.W.
1869		Vaughan, Howard, 55, *Lincoln's Inn Fields*, W.C.
1849		Vaughan, P. H., *Redland, Bristol.*
1866		Verrall, G. H., *Friar's Cottage, Lewes, Sussex.*
1870		Walker, Rev. Francis Augustus, M.A., F.L.S., *Dry Drayton Rectory, Cambridge.*
1858		Wallace, Alexander, M.D., *Trinity House, Colchester.*
1863		Wallace, Alfred Russel, F.L.S., F.Z.S., &c., *The Dell, Grays, Essex.*
1866		Walsingham, Thomas de Grey, Lord, M.A., F.Z.S., &c., 23, *Arlington Street*, W.
1866		Ward, Christopher, F.L.S., *Savile Road, Halifax.*
1874	S.	Ward, Allan Ogier, 11, *Old Broad Street*, E.C.
1875		Ward, Frederick Henry, *Springfield, Tooting*, S.W.
1850		Waring, S. L., *The Oaks, Norwood*, S.E.
1869		Waterhouse, Charles O., *British Museum*, W.C.
•		Waterhouse, George R., F.Z.S., &c., *British Museum*, W.C.
1869		Websdale, C. G., 78, *High Street, Barnstaple.*
1845		Weir, John Jenner, F.L.S., 6, *Haddo Villas, Blackheath*, S.E.
•		Westwood, John Obadiah, M.A., F.L.S., &c., Professor of Zoology, *Walton Manor, Oxford.*
1868	†	White, F. Buchanan, M.D., *Perth*, N.B., F.L.S.
1865		White, Rev. William Farren, *Stonehouse Vicarage, Gloucestershire.*
1874		Wilson, Owen, *Cwmffrwd, Carmarthen.*
1843		Wollaston, T. Vernon, M.A., F.L.S., 1, *Barnepark Terrace, Teignmouth, Devon.*
1874		Wood-Mason, James, Curator of the Indian Museum, *Calcutta.*
1862		Wormald, Percy C., 2, *Clifton Villas, Highgate Hill*, N.
1866		Wright, E. Perceval, M.A., M.D., F.L.S., &c., Professor of Botany, *Trinity College, Dublin.*
1865	S.	Young, Morris, *Free Museum, Paisley.*

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THE

TRANSACTIONS

OF THE

ENTOMOLOGICAL SOCIETY

OF

LONDON

FOR THE YEAR 1875.

I. *Contributions towards a knowledge of the* Rhopalocera *of Australia.* By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

[Read 1st February, 1875.]

I HAVE, for some time past, contemplated writing a descriptive Catalogue of the Rhopalocera of Australia, somewhat after the plan of my friend Trimen's admirable treatise on the African butterflies—*Rhopalocera Africæ Australis;* indeed, I have a great part of the MS. ready for the press, but one cause or another has, for months past, prevented my continuing it; and, as I do not at present see my way clear to complete it, I propose in the paper now before the Society to describe several species which I have determined to be new to science (the types of which I am anxious to secure for the National Collection), and at the same time to make a few observations upon the work of other authors who have written on the butterflies of Australia.

Subfam. DANAINÆ.

Calliplœa, n. gen.

Wings broad and short, primaries of the male with inner margin distinctly convex; the wing not marked

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with sericeous streaks; secondaries of the male with a pale, generally ovate patch upon the subcostal nervure; antennæ rather short, slender.*

Type, *C. darchia* (*Euplœa darchia*, M'Leay).

Calliplœa niveata, n. sp.

Wings above pitchy-brown, brilliantly shot with purple; primaries with a lilacine white subcostal spot beyond cell; a disco-submarginal series of nine lilac-edged white spots, united and placed obliquely towards apex; secondaries with costal area broadly silky whitish; a subochraceous patch on upper half of discoidal cell; a broad white submarginal band, beginning at the anal angle and suddenly diminishing on first discoidal interspace, whence it is only represented by two small subapical white spots on the subcostal interspaces: body blackish; head, prothorax and pterygodes white-spotted; wings below olivaceous-brown; primaries with a submarginal series of white dots and an elongate lilacine white spot on first median interspace; secondaries with two apical submarginal white dots; base black, white-spotted: body blackish, white-spotted: expanse of wings 2 inches, 11 lines.

♂, ♀ Queensland (*Whitely*); ♀ Australia. Type, B. M.

Allied to *Calliplœa hyems* from Timor, with which I confounded it in my Monograph, not having seen more than a single example; since then, however, I have examined several of them and found them quite constant; there are examples in Mr. Druce's collection.

The most nearly allied Australian species is *C. prinpus* of my Monograph, an insect closely allied to, but larger, darker and altogether more brilliantly coloured than *C. darchia* of M'Leay.

Subfam. SATYRINÆ.

Genus HYPOCYSTA.

Hypocysta undulata, n. sp.

Nearly allied to *H. Adiante* of Hübner, but the primaries with comparatively longer costal and outer margins;

* In this genus I propose to group the *E. Tulliolus* section of the old genus *Euplœa*; the latter designation comprehends at least three good natural genera.

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inner margin shorter; secondaries with costal margin shorter; inner margin longer; colouring on both surfaces much brighter; marginal brown borders above better defined but narrower; secondaries with apical spot indicated as an ocellus; discal ocellus smaller, widely separated from the margin; primaries below with indication of submarginal streak; secondaries with dusky basal area not extending to the end of cell, crossed by an ill-defined brownish zigzag line, its outer edge dentate-sinuate and of a brighter red-brown than in *H. Adiante;* ocelli smaller, all well separated from basal area: expanse of wings 1 inch, 5 lines.

Champion Bay (*Du Boulay*). Type, B. M.

Hypocysta metirius, n. sp.

♂ Wings above smoky-brown; secondaries with an irregular discal fulvous fascia extending from the second subcostal to the first median branch, deeply sinuated internally beyond end of cell, and dentate-sinuate externally, bounded at its lower external edge by a large black subanal ocellus, with white pupil and orange iris; a narrow anal submarginal orange lineole: body greyish-brown: wings below altogether paler than above, primaries with an indistinct transverse discal line, an irregular submarginal line and an almost marginal line; outer margin subochraceous; a small indistinct subapical ocellus; secondaries with two irregular reddish-brown central lines, the outer one bounding the basal area; disc pale ochreous, outer margin orange; ocelli and silver lines as in the preceding species: body pale: expanse of wings 1 inch, 6 lines.

♀ Larger and altogether paler than the male; primaries below with discal transverse line dentate-sinuate; secondaries with ocelli smaller; margin paler: expanse of wings 1 inch, 6½ lines.

Australia (*Stephenson* and *Argent*). B. M.

Hypocysta pseudirius, n. sp.

♂ Wings above smoky-brown; secondaries with discal area from second subcostal to below first median branch fulvous, irregular externally; a minute apical ocellus and a conspicuous black ocellus with white pupil, fulvous iris, and dusky zone, cut by the second median branch; a submarginal fulvous line: body grey-brown: wings below

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pale grey-brown; primaries with apical half of discal area irrorated with creamy scales; an indistinct submarginal dentate-sinuate brown line; two punctiform black ocelli on discoidal interspaces: body below white; secondaries with two central irregular brown lines; discal area stramineous; four black ocelli with white pupils, narrow yellow irides and silver zones, the first apical, the second small, on lower discoidal interspace, the third and fourth on median interspaces, enclosed in a single silver zone; a submarginal silver band; outer margin orange; fringe grey-brown: expanse of wings 1 inch, 5 lines.

Between Sydney and Moreton Bay (*Damel*). B. M.

Hypocysta epirius, n. sp.

♂ Wings above pale smoky-brown; secondaries with discal area pale ochreous, nearly as in *H. pseudirius*, but the brown outer margin narrower and intersected by a broader ochreous line; discal ocellus sometimes double: body grey-brown: wings below rather paler; secondaries with two very irregular central brown lines; discal area pale brownish-stramineous; ocelli as in *H. pseudirius*, but smaller; silver zones and submarginal band indistinct: body below cream-coloured: expanse of wings 1 inch, 5 lines.

♀ Broader than male and rather brighter in colouring; secondaries above with ill-defined ocellus on lower discoidal interspace; primaries below with paler discal area; an indistinct angulated brown line and a dentate-sinuate submarginal line; two punctiform black ocelli on discoidal interspaces: expanse of wings 1 inch, 6 lines.

♂ Australia (*Macgillivray*); ♀ Moreton Bay (*Gibbons*). B. M.

Subfam. NYMPHALINÆ.

Genus NEPTIS.

Neptis latifasciata, n. sp.

Nearly allied to *N. Shepherdi* of Moore, but differs from it in the less distinct discoidal streak and spot of primaries, the larger discal spots, the more distinct submarginal spots; and the much broader transverse band of secondaries: expanse of wings 2 inches, 9 lines.

Queensland (*Whitely*). Type, B. M.

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Neptis mortifacies, n. sp.

Wings above black-brown, fringe white-spotted; primaries with three points in the cell, two placed obliquely beyond the cell, a subcostal point, and two subapical discal spots (placed obliquely), a large bifid spot (cut by the second median branch) on disc, an elongate bifid spot on inner margin, and an irregular submarginal series of small spots, white; the large discal and the internal spots narrowly edged with dull lilacine scales; secondaries with a broad central subquadrate white band, narrowly edged externally with dull lilacine; six minute discal white points: body dark brown: wings below olivaceous-brown, all the white markings much larger than above; discoidal area of primaries reddish-brown, internal area pale brown; a basal subcostal white streak; secondaries with a dirty-white subbasal band: body creamy whitish: expanse of wings 2 inches, 5 lines.

Queensland (*Whitely*). Type, B. M.

Allied to *N. Venilia* and *N. illigera*, the large discal spot of primaries directed inwards as in the latter species, the band of secondaries as broad as in the broadest examples of *N. Agatha*.

Junonia albicincta, n. sp.

Junonia Orithya, Linn. (part).

♂ Primaries above black, two reddish-orange spots in discoidal cell, central costal area sordid white, a white oblique band from second third of costa to outer margin, sinuated internally, cut by the black nervures, and interrupted on lower discoidal and second median interspaces by a blue-black transverse fasciole; a trifid white subapical fasciole; a submarginal series of decreasing sordid white spots; fringe white-spotted, a small subapical black ocellus with purple pupil and orange iris, and above it part of a second similar ocellus; a very indefinite ocellus on first median interspace; secondaries bright blue, changing in certain lights to violet; interno-basal area black; costa and inner margin brown; a small ocellus on first median interspace, and occasionally a black spot with purple centre on upper discoidal interspace; outer margin, including fringe, broadly white; the edge and a very narrow submarginal line grey-brown: body black-brown, head reddish, antennæ white: wings below sordid white or cream-coloured; pri-

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maries with discoidal area pale pearly blue, crossed by three black-edged orange bands; discal area crossed from costa to external angle by a broad diffused dark brown nebulous band, relieving the white band of upper surface; ocelli as above, but sometimes dull and always distinct; all the white spots as above; secondaries crossed towards base by several indistinct brownish or better defined orange lines; an oblique dark or reddish-brown sinuated band (sometimes represented by two parallel lines) from costa to anal angle; discal area at times somewhat dusky, a row of blackish dots, two of which are most frequently represented by large violet and black ocelli with orange irides; a submarginal series of brown inverted lunules and a fine marginal line: body cream-coloured: expanse of wings 2 inches, 1 line.

♀ Larger than the male, both ocelli well defined on all the wings; basal half of secondaries above black-brown; marginal lines well marked; orange colouring below pronounced; a distinct, pale-ochraceous, forked marking towards base of secondaries: expanse 2 inches, 2 lines.

N. Australia (*Elsey*); Queensland (*Whitely*). B. M.

This species, although nearly allied to *J. Orithya*, may always be distinguished by the much whiter outer border of secondaries; the male also differs constantly in the obsolete character of the lower ocellus of primaries, the almost entire absence of blue at external angle, and frequently in the absence of the upper ocellus of secondaries, both of the ocelli being also constantly smaller.

Genus Diadema.

Diadema constans, n. sp.

♂ Similar to *D. nerina* ♂, from which it differs as follows:—Primaries with outer margin paler; subapical white spot bifid, postcellular trifid white patch much narrower; a discal series of five white dots from the subapical spot to beyond the outer extremity of the postcellular patch; secondaries with the central quadrifid white patch narrower (sometimes entirely suffused with lilacine); five discal white dots; marginal area paler: wings below altogether more uniform in tint; the marginal and submarginal lunulate spots uniformly dull buff; the white bands narrower and tinted with pink, that of secondaries edged with purplish internally; the discal series of dots uniformly small and white; primaries with barely a trace of the reddish colour-

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ing in discoidal cell, no black colouring on the lower half of disc, and the subcostal spots reduced to minute dots: expanse of wings 3 inches, 2 lines.

♀ Somewhat like *D. nerina* ♀, but without a trace of the tawny colouring above, with the white band of primaries and the broad central white patch of secondaries surrounded and tinted with brilliant purple instead of bluish-green; the squamose submarginal lunules pale brown; secondaries with the outer edge of the central patch dentate-sinuate as in *D. Diomea;* five discal white dots; wings below much more uniform than in *D. nerina*, submarginal lunulate spots whitish, becoming obsolete towards apex of primaries; the white band of secondaries much broader, dentate as above; the discal series of small spots smaller and whiter; primaries with only a tint of reddish on basal half of primaries, no tawny patch; only the external angle blackish; secondaries with no trace of the mahogany-colour on outer half of disc; costal spot semicircular, submarginal spots larger: expanse of wings 4 inches, 4 lines.

♂, ♀ Tasmania? Type, B. M.

The above species was purchased at the sale of the Collection of the Entomological Society, and as it is certainly of the Australian type, and many of the Lepidoptera then obtained were from Tasmania, I have little doubt but that the above locality is correct: there were certainly some N. Indian insects in the same lot, but the Indian type of *Diadema* is quite distinct from the Australian; besides which it is probable that if it were an Indian species Mr. Moore would have it in his Collection, which he certainly has not.

Before leaving, for the present, the Australian Butterflies, I should like to say a word or two respecting the Catalogue prepared by Mr. Masters, and Mr. Miskin's criticism of it in a paper read before the Entomological Society in 1873. I need scarcely say that I do not agree with either author in rejecting the excellent arrangement of the Suborder proposed by Mr. Bates in the Journal of Entomology; for I think, when they have seen and studied that paper (instead of ascribing the arrangement to our worthy friend Mr. Kirby), they will at once see that it is the only classification of the butterflies ever proposed which shows a clear perception of the affinities of the groups, or which reduces them to anything like a natural series.

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Mr. Miskin corrects Mr. Masters as to *D. Petilia* of Stoll, but he is mistaken; *D. Chrysippus* is perfectly distinct; we have plenty of both, and they are as constant as any two existing species: *D. Chrysippus* does not occur in Australia; *Danais limniace* does not occur in Australia, it is only found in India; *D. hamata* is a smaller and quite distinct species, and is, I think, identical with *D. australis* of Boisduval; *Euplœa Angasii* is a perfectly distinct species, of which we have a good series in the Collection of the British Museum; it is more nearly allied to *E. eleutho* than to *E. sylvester*, Fabr.*

There are, I believe, four distinct species of *Diadema* in Australia—*D. alimena*, Linn.; *D. alcmene*, Cramer (white bands on undersurface of both sexes indistinct); ♂ *D. auge* = ♀ *D. nerina* = ♀ var. *D. proserpina*, Cram. (white bands below distinct, tawny colouring more prevalent above); and *D. constans*, n. sp., suprà.†

Diadema Lisianassa (nec *Lasinassa*) is = *D. Manilia*, Cramer, and only occurs, so far as I know, in Amboina: *D. Bolina* ranges all over India, from the Himalayas to Ceylon, and is of a very different type.

Argynnis niphe does not occur in Australia; the insect intended is *A. inconstans*, Butler (Cist. Ent. vii. p. 164): *A. niphe* is a well-known mimic of *Danais Chrysippus*, but, so far as I have been able to ascertain, *A. inconstans* has not followed its example with respect to *D. petilia*.

Cynthia arsinoë of Masters is the *C. ada* of M. R. Butler, P. Z. S. 1873; *C. arsinoë* appears to be confined to Amboina and Ceram, but at any rate the Queensland species is utterly different.

Doleschallia Australis, Felder, is quite distinct from *D. bisaltide*. Mr. Miskin is also wrong in considering the genus to be identical with *Kallima*.

Mycalesis Remulia of Cramer does not occur in Australia, the *Satyrus Remulia* of Godart being quite distinct, and = *M. terminus*, Fabricius.

In my Catalogue of *Satyridæ* I restricted *Xenica*, Westwood, to the two species *X. abeona* and *X. Joanna*; and as I have figured the structural distinctions between my two genera *Geitoneura* and *Argynnina*, it would be

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* With regard to this species see my Fabrician Catalogue, p. 3 (1869).

† We have a good series of *D. alcmene* and *D. auge* in both sexes, but no intermediate.

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mere waste of time to repeat them here: as Professor Westwood, in first characterizing the group *Xenica* as a subgenus, did not mention which of the species included therein was his type, I had an admitted right, when I split it up into three genera, to select any one of the species as type, and I was perfectly justified in retaining that type in its original position (making it a subgenus of *Epinephele*, as it had formerly been of *Lasiommata*). Kirby in this, as in several other instances, went out of his way to sink properly constituted genera: he would have done much better had he restored *Thecla betulæ* to its genus and turned out all the pretty invaders which are often now referred to the Fabrician genus, to the exclusion of the type; this must be done eventually,—indeed most Entomologists are doing it already.

Mr. Masters has wrongly referred the species of *Hypocysta* to *Cœnonympha* (not to *Mycalesis*); but I believe that *Cœnonympha* does not occur in Australia.

Mr. Masters also asserts that *T. Hecabe* is = *T. Sari* of Horsfield (of which we possess the type); I can assure him, however, that the two insects are as distinct as almost any two in the genus: *T. Sari* is confined to Java, Borneo and perhaps Malacca.

Pieris aruna of Masters (nec Boisduval) is *Delias inferna* of Butler: *D. cæneus* does not occur in Australia, nor does a single typical *Pieris;* the species in the Catalogue by Mr. Masters are referable to the three genera *Delias, Appias* and *Belenois: Eronia* does not occur in Australia, but *Nepheronia* may. *Callidryas* is now restricted to the *C. eubule* group, the Old World species being all referable to *Catopsilia.*

C. evangelina does not occur in Australia, nor does *C. pyranthe.* In the *Papilioninæ,* I would correct the following errors—*Ornithoptera euphorion* and *O. poseidon* are sexes; *Papilio erithonius* is not = *P. sthenelus,* and does not range into Australia; *P. sarpedon* is quite distinct from *P. choredon,* and *P. ulysses* from *P. joesa; P. sarpedon* ranges from N. India to Borneo, but I think no farther; *P. ulysses* is confined to the Moluccas, and is as distinct from *P. joesa* as it is from *P. philippus, P. pericles* or *P. telegonus. P. lycaon,* Westw., has nothing whatever to do with *P. eurypylus,* L.

In the *Hesperidæ,* I would suggest that the generic designation *Proteides* be abandoned, *P. vulpecula* of Prittwitz not being a *Proteides,* but = *Netrocoryne*

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repanda of Felder. *N. beata* and *N. denitza** of Hewitson are not referable to the latter genus, but to *Chætocneme*. *A. argenteo-ornatus* of Hewitson is certainly not an *Astictopterus*. *Hesperilla halyzia* and *H. Leachii* are sexes.

As regards the *Lycænidæ*, I have paid but little attention to them, but I should refer "*Lucia*" *lucanus* to *Zeritis*; *L. aurifer* is identical with *Lycæna discifer*, and would better be placed in *Chrysophanus*; *Holochila absimilis*, Felder, should be retained as a distinct genus; *L. agricola* is a *Lycæna*, *L. alsulus* probably a *Lampides*, *L. amazara* a *Lycænesthes*, *L. ancyra* and *berenice* species of *Lampides*, *L. biocellata* probably *Lycænesthes*, *L. byzos* probably *Scolitantides*, *L. cnejus* and *damoëtes*, *Lampides*; *L. danis* a *Danis*, *L. dion* a *Lampides*, *L. erinus* a *Lycæna*, *L. ignita* a *Miletus*, *L. labradus* and *lysimon*, *Lycænæ*; *L. perusia*, *platissa*, *serpentata* and *strabo* species of *Lampides*, *L. salamandri* = *L. taygetus* a *Danis*, *L. xanthospilos* a *Pithecops*.

The name *Miletus* has priority over *Hypochrysops*, and should be retained: *M. epicletus* is not Australian. There are two nearly allied species of *Amblypodia* in Australia, one of them nearly allied to *A. amytis*, the other to *A. centaurus*; probably Mr. Miskin got hold of one and *Mr. Masters* of the other; the two insects seem both to be distinct from the above-named species.

Since the publication of Mr. Masters' Catalogue, several new Australian forms have been described both by Mr. Hewitson and myself, but I shall reserve them, as well as the question of admitting all the other species claimed for the Australian fauna by Mr. Miskin, for my intended work on the Butterflies of Australia.

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* Hewitson's figures of these species are, I believe, wrongly numbered.

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II. *Descriptions of new species of* Endomycici. By the Rev. H. S. Gorham.

[Read 1st March, 1875.]

Genus Trycherus, Gerst.

Trycherus longanimis, Thomson, Arch. Ent. ii. 238, nec *erotyloides*, Gerst.

Oblongus, elytris ovatis, nigro-piceus, nitidus, thoracis lateribus rufo-piceis, elytris fasciâ ante medium denticulatâ a suturâ interruptâ, lunulâque subapicali flavis, apice fuscâ. Long. lin. 5, ♂, ♀.

Mas, tibiis anticis dente parvo ad apicem interne armatis, intermediis sinuatis muticis, abdominis segmento penultimo carinâ transversâ, hâc medio exculptâ.

Head thickly and rather more strongly punctured than the thorax, the latter twice as wide as long, widest at the base; the sides scarcely sinuate, but more suddenly narrowed in at the apical angles, which are prominent and triangular; hind angles acute, a little produced behind. Sides and base margined, basal sulci depressed, extending beyond the middle. Elytra elongate-oval, obsoletely punctured, and (under a strong lens) appearing finely coriaceous between the punctures; before the middle a yellow fascia, interrupted by the suture, and not continued across the reflexed margin, produced at each end, both forward and behind, and having a denticulation in the middle behind, that which is on the margin towards the base of the elytra the longest, reaching to the humeral callus; the apex is fuscous, shading off into a yellow lunule. Body beneath, legs, and club of the antennæ pitchy; the rest of the latter, the elytra and disc of the thorax pitchy-black.

In the male the front tibiæ have near their apex a small triangular tooth, or rather projection, while the middle pair are only sinuous, and not incised, as is frequent in this genus. The fourth segment of the abdomen has, in the middle of its hind margin, a short transverse carina, depressed in the centre, and hence appearing bituberculate.

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The female has the club of the antennæ very much less dilated, and its apical joint short, and nearly wholly testaceous.

Hab.—Old Calabar, Coll. Fry. Gabon, Coll. Gorham.

Obs.—I have in my Catalogue (End. Rec., p. 11) referred this species to *Erotyloides*, Gerst. It is, however, quite distinct, though resembling it in colour and pattern; it may be known by its greater size, and more elongate form. The male of *Erotyloides* is not known. The specimen in my collection is labelled "*longanimis*, Th." The description given by Thomson being so brief, I have thought it better to re-describe this species.

Trycherus Fryanus, n. sp.

Oblongus, elytris ovalibus, nigro-piceus, nitidus, elytris rufo-piceis, margine laterali, maculis tribus, unâ sub-humerali, duabus oblongis mediis in fasciam fere digestis, suturâ, apiceque indeterminate nigro-piceis. Long. lin. 4, ♂.

Mas, tibiis intermediis dente parvulo sub-apicali instructis, apice infra dentem incurvato.

Head thickly, rather strongly, thorax more sparingly and lightly punctured; the latter transverse-quadrate, with the sides parallel from the base to the middle, thence narrowed to the apical angles. Hind angles right; lateral margins somewhat thickened and raised; surface uneven; basal sulci indistinctly defined. Elytra wider and more oval than in *tricolor*, Gerst., thickly and strongly punctured, pitchy-red, with the margins entirely (except at the base near the scutellum) of the same dark pitchy-black as the rest of the body; the same colour forms two oblong spots, conjoined in the middle, and which also join the margin, and the apex is also dark. The club of the antennæ is not much dilated; joints 4—8 are longer than wide, 9 and 10 gradually widened; apical short, transverse; legs and underside dark pitchy. In the single specimen which I have seen, and which is a male, the 2nd, 3rd, and 4th segments of the abdomen beneath are a little raised in the middle of their hind margins. The middle tibiæ have their apices bent inwards in the broken-looking way so frequent in the *Eumorphidæ*, and with a minute tooth just above this inflexion. It is scarcely correct to describe them as incised, though they have this appearance.

Hab.—Angola. Coll. Fry.

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Family EUMORPHIDÆ.

Genus EUMORPHUS, Weber.

Eumorphus Fryanus, n. sp.

Niger, nitidus, thorace transverso, antice angustato; elytris ovatis maculis duabus magnis rotundatis flavis, politis. Long. lin. 5½—6½, ♂, ♀.

Mas, tibiis anticis infra medium dente distante intus, processu compresso, triangulari, extus instructis; tibiis intermediis fortius inflexis.

Nearly allied to *E. Guerini*, Gorh. Larger and rather more convex. The spots on the elytra are also larger. Antennæ of moderate length. Thorax transverse in the male, the hind angles acute, and produced, but not much deflexed; in the female they are rectangular, the sides of the thorax are more thickened and reflexed in the female, and their thickened edge is somewhat "puckered," a character I also notice in *Guerini*. Elytra very smooth, evenly elliptical and convex, margin of moderate width; body beneath and legs black; the apex and sides of the abdomen are obsoletely punctured. The most apparent difference between this species, and the one I have described as *Guerini*, is to be seen in the construction of the front and middle pairs of tibiæ; the outer edge of the front tibiæ in *Fryanus* being widened from the base to about the middle into a sharp keel, which is obliquely cut off at that distance from the apex on the inner side, and immediately below and opposite this keel is the usual tooth; the middle tibiæ are much bent at their middle, and the apex compressed, giving them a distorted look.

Hab.—Malacca. Six specimens in Coll. A. Fry, Esq., to whom I dedicate the species.

Family CORYNOMALIDÆ.

Genus CORYNOMALUS, Erichs.

Corynomalus vexillarius, n. sp.

Ferrugineus, thorace transverso angulis posticis rectis, elytris fortiter parcius punctatis læte violaceis, margine toto, suturâ, fasciâque medianâ rectâ luteis, antennarum clavâ nigrâ. Long. lin. 3½—4.

Head and thorax shining, uneven, the latter rather

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wider than in *C. discoideus*, with a central furrow, and well-marked transverse impression before the front margin; hind margin with the basal line fine, and sulci as in *discoideus*. Elytra sub-cordate, with four large lilac-violet marks, occupying the humeral and apical quarters; the entire margin and suture, and a central fascia, pale testaceous; the fascia varies in width, but is as wide as the sutural band in the narrowest examples, and is straight, sometimes widest at the suture. The disc is sparingly and rather irregularly covered with largish impressions and smaller punctures; the lateral margins with a row of larger ones. Antennæ and legs yellow, club of the former black. A species by its pattern reminding one of *quadrimaculatus*, but most nearly allied to *discoideus*.

Hab.—Ecuador, East Andes and Peru. Coll. Fry.

Corynomalus maculicollis, n. sp.

Ferrugineus, nitidus, elytris nigro-cæruleis crebrius sat fortiter punctatis, interstitiis subtiliter coriaceis, margine apicali testaceo; antennis tibiisque nigris, his apice, illis articulo primo rufis, thoracis disco maculis duabus magnis fere confluentibus nigris. Long. lin. 3½—4.

Head and thorax shining, disc of the latter finely punctate, twice as wide as long; the entire space between the basal sulci is almost occupied by two large black markings, only divided by a narrow median line of the same colour as the rest of the thorax. Elytra of a deep indigo blue, with the apical margin alone yellow, thickly covered with larger irregular punctures, and smaller ones between these; the disc is nevertheless shining. Legs red; tibiæ (apex excepted) black; antennæ black, one or two joints at the base red. Underside of thorax and body entirely red. Allied to *discoideus*, [and also perhaps to *apicalis*, Gerst.; the latter, however, I have not been able to see; the species most nearly agreeing with his description that I have seen having *black* tibiæ, which Gerstaecker does not mention].

Hab.—Peru. One in Coll. Fry, and one in my own Coll.

Corynomalus felix, n. sp.

Ferrugineus, thorace transverso angulis posticis rectis, interdum disco piceo; elytris cordatis fortiter subrugose

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punctatis violaceis, vel viridi-æneis; apice late testaceo. Antennis nigris, articulis duobus basalibus rufis; tibiis basi nigris. Long. lin. 3½, ♀.

Equal in size to the smallest examples of *discoideus*, to which it is also allied in form; the elytra are wider near the shoulder, but not so widely margined, and the colour of the antennæ, legs and elytra differs from that species. Head and thorax very shining, scarcely punctured, the disc of the latter, however, under a strong lens, exhibits fine but distinct punctures; sides rounded from the front angles to the middle, from whence they are straight to the base; the usual impressions are deep but rather vaguely marked; in the middle is a short distinct channel, in some specimens clear red, in others with the central portion pitchy. The elytra are more cordate than in *discoideus*, but not so convex, coarsely punctured, the punctures often running together; the edge rather narrowly margined, pitchy-red, and with the usual row of large impressions; of a brilliant violet or brassy green, apex pale testaceous, this colour continuing some way up the suture; antennæ and base of the tibiæ black, two joints at the base of the former alone red. This is one of a little group of species which have the apex of the elytra alone red.

Hab.—Peru (Haulhaga River). Coll. E. Bartlett, Esq.

Family EPIPOCIDÆ.

Genus EPIPOCUS, Germar.

Epipocus mollicomus, n. sp.

Oblongus, testaceus, sub-opacus, pube depressâ albidâ vestitus, tibiarum basi et antennis nigris, his articulis duobus primis, apiceque testaceis; elytrorum apice integro. Long. lin. 4., ♂, ♀.

Mas, tibiis anticis in tertiâ parte apicali compressis, et sub-dentatis.

Oblong, somewhat parallel, very pale testaceous; head even, finely and closely punctured between the eyes; antennæ rather stout, black, first and second joints pale testaceous, third equal to these in length, and as long, or nearly so, as fourth and fifth, which are about equal to each other in length; apical half of the terminal joint testaceous. Thorax transverse, at its widest point half as wide again as long; basal sulci evenly and distinctly

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marked, arcuate, converging; the disc between these sparingly but deeply punctured, the marginal portion much more obsoletely and more closely so. Sides *in the male* converging from the base; hind angles acute, in the female nearly parallel at the base, and rendering the hind angles nearly right, in both sexes rounded in to the apical angles; disc with two indistinct darker spots, occupying a depressed point at the end of the basal sulci. Scutellum thickly and distinctly punctured. Elytra closely and finely punctured, the suture and margin are a little paler than the rest of the surface, clothed with a fine depressed pubescence. They are very little wider in the middle than at the shoulder, and their apex is entire in both sexes. Underside finely punctured; meso- and meta-sterna darker, the parapleuræ of the latter being pitchy-red. Legs pale; base of the tibiæ black.

Hab.—Truqui, Mexico. Two specimens. Coll. Fry.

Genus Epopterus, Erichson.

Epopterus dilectus, n. sp.

Oblongo-ovalis, rufo-piceus, pubescens, crebrius leviter punctatus; thorace maculis quatuor paulo distinctis et antennarum clavâ nigris; elytris fasciis duabus, a suturâ interruptis angustioribus albido-flavis. Long. lin. 2.

Head almost smooth, thorax fully twice as wide as long, thickly and finely but distinctly punctured; hind angles right, a little deflexed, sides rounded in the apical third, finely margined by an impressed line, which disappears in the hind angles. Disc with two black spots near the middle, and with very slight traces of two others near the margin. Elytra a little wider than the thorax, sides parallel below the humerus, covered with a fine silky pubescence, obsoletely punctured. A narrow, pale-yellow fascia commencing just below the humeral callus and directed in a slightly oblique direction towards the apex, not reaching the suture; a second, rather more irregular in shape, near the apex, and a little inclined towards the first at the suture. Antennæ and legs pale clear testaceous, club of the former alone darker; two apical joints black.

This species is evidently related to *E. cucullinus*, Gorh. (End. Rec., p. 49), but is smaller and more oblong; the pale markings are narrower and less irregular in outline, the apex of the elytra concolorous, &c.

Hab.—Ecuador, East Andes (Buckley). Coll. Fry.

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Genus EPHEBUS, Gerstaecker.

Ephebus depressus, n. sp.

Oblongo-ovatus, depressus, rufo-piceus, pube griseâ tenuiter vestitus, antennis concoloribus articulis sex ultimis piceis, thorace antice angustato, lateribus à basi usque ad medium subparallelis, angulis posticis sub-acutis. Long. lin. 3, ♀.

Head and thorax thickly and strongly punctured, basal sulci short, and not connected by any transverse impression, the base being only margined in the middle by a fine raised line; the sides and front margin have the extreme edge finely raised also; sides sinuate, being rounded from the front angles to about the middle, whence they are parallel to near the hind angles; these are a little turned out, and so acute. On the disc (in the single specimen under observation) are two large fossæ near the middle; I am, however, inclined to think these are accidental. Elytra of the width of the thorax at their base, thence gradually widened to past the middle; more than twice as long as the head and thorax, shining, closely and moderately strongly punctured, and with a fine grey pubescence. Antennæ of the length of the head and thorax, pitchy-red, with joints 6—10 darker, and apical joint pitchy, but lighter than the five preceding; the joints 6, 7, 8, are ball-shaped, 9 and 10 acuminate on the inner side, 11 trapezoidal, widest externally. Legs testaceous.

Some of the details of this species do not quite accord with the few *Ephebi* (*e. g. cardinalis*, G.) which I have examined—notably the terminal joints of the antennæ and maxillary palpi—yet its general appearance and structure so far agree with *Ephebus*, as defined by Gerstaecker, that I think it better to place it in that genus at present.

Hab.—Rio Janeiro. Coll. Fry.

Ephebus ignobilis, n. sp.

Ovatus, tenuiter pubescens, testaceus, antennarum clavâ nigrâ, thorace disco parcius, lateribus crebrius fortiter punctatis. Long. lin. 2.

Head with a few scattered punctures; thorax at base twice as wide as long, hind angles a little acute, disc moderately, sides thickly and strongly punctured. Elytra punctured at the base, but only very obsoletely below the

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middle, very evenly ovate, and fairly convex. Antennæ longer than the head and thorax, everywhere with longish setæ, of the same colour as the body, excepting the club alone, which is black.

Hab.—Cayenne: in my own Collection.

Genus Stenotarsus.

Stenotarsus macroceras, n. sp.

Oblongus, ferrugineus, purpureo-pubescens, antennis nigris, corporis fere longitudine, articulis tribus primis rufis, thorace elytris multo angustiore, angulis posticis acutis. Long. lin. 4—4½, ♂, ♀.

Head and thorax clothed with greyish-yellow pubescence, the latter at the base about twice as wide as long; hind angles acute and turned outwards, sides above the base nearly straight, narrowed to the apex, a little rounded in to the apical angles, which are not very prominent; lateral margins flat, rather wider at the hind angle; a short finely-impressed line represents the basal sulcus, which is only visible in rubbed specimens. Elytra at the base half as wide again as thorax, of a rich brick-red, with a very short velvet pubescence, which reflects a coppery-red light; sides a little widened to the middle, thence evenly rounded to the apex: fully twice as long as wide, humeral callus well marked, ridge-shaped. Antennæ black, three basal joints clear red, very long; in the smaller specimens of the length of the whole body, in the larger, three-quarters of its length; joints 3, 4 and 8 equal in length; 5, 6, 7 longer than these and nearly equal to the first joint of the club (9); 9 and 10 elongate, sub-cyathiform, acuminate internally; 11 compressed, oval-elongate. Legs thin and long, clear red.

Obs.—This curious species is evidently allied to *S. purpuratus*, Gerst., but is still more abnormal among the *Stenotarsi* than that species; the great length of the antennæ and small thorax reminds one of *Homoiotelus* among the *Erotylidæ*.

Compared with *S. purpuratus*, the antennæ have the joints before the club much longer and thorax wider at the base and more narrowed in front.

Hab.—Columbia, Nova Grenada, Ecuador. Coll. Fry.

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Stenotarsus scymnoides, n. sp.

Oblongo-ovalis, rufus, pube erectâ flavâ vestitus, antennarum clavâ nigrâ, elytris fortiter sparsim punctatis, thoracis margine laterali leviter excavato retrorsum attenuato. Long. lin. 1¼.

Head and disc of the thorax shining, with a few small punctures, the latter with the side narrowed in front, slightly rounded; lateral margins wide, considerably raised, narrowed a little towards the base and with its own sides raised, thus giving it the appearance of being concave: base with a deep fossa just within the lateral margin. Elytra elongate-cordate, widest about one-third from the base; shoulders raised into a tubercle, which is often lighter in colour than the rest of the surface, their disc coarsely punctate, except near the scutellum, and with smaller punctures here and there; the larger punctures are most conspicuous towards the shoulders and apex; their surface is uniformly clothed with a fine, but thick, erect, yellow pile. Antennæ about half the body's length, clear testaceous-red, excepting only the club, of which the extreme apex even is red; the eighth joint is pitchy in some specimens, the basal joints are rather longer than wide; ninth and tenth much wider than preceding, subquadrate; eleventh twice as long as wide. Legs red.

Hab.—Rio Janeiro. Coll. Fry.

Stenotarsus pantherinus, n. sp.

Oblongo-ovatus, ferrugineus, nitidus, antennarum clavâ, thoracis disco elytrorumque maculis duabus obliquis nigris. Long. lin. 3.

Closely allied to *S. pardalis*, Gerst., but readily distinguished from that species by the absence of the sutural and apical spots. The basal spot does not quite reach the base, whereas all the specimens I have examined of *pardalis* have it commencing from the base, very nearly reaching to the scutellum; both the spots are also more oval and oblique. The punctuation is finer, the striæ less visible. The underside is entirely red, without any indication of the dark sides of the meso-sternum and abdomen which are usually to be observed in *pardalis*.

From *nobilis*, Gerst., the position and form of the spots will at once distinguish it.

Hab.—Peninsula Malacca, Penang. Coll. Gorham and Fry.

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[Section A. b.]

Stenotarsus punctato-striatus, n. sp.

Oblongo-ovatus, nitidus, griseo-pubescens, thorace antice angustato, margine laterali deplanato, parum elevato; elytris punctorum seriebus octo impressis interstitiis fere glabris, antennarum clavâ validâ nigrâ. Long. lin. $2\frac{1}{2}$.

Thorax with the sides strongly narrowed in front, sinuate, forming acute hind angles; lateral margins of nearly even width, a little raised, flat. Elytra narrower than in *Guineensis*, Gerst., or *æquatus*, Gorh.; the sides more rounded and narrowed behind than in those species, thickly pubescent, with eight series of small punctures, the punctures in each separate row being numerous and close, flat-bottomed. Antennæ of moderate length and stoutness; joints 2 and 8 as wide as long; 3 to 7 *longer than wide*, club stout; black, joints 9 and 10 obconical, slightly acuminate within, 11 oblong oval.

Hab.—Old Calabar. Coll. A. Murray.

Genus Rhymbus.

Rhymbus Rhizobioides, n. sp.

Fere hemisphæricus, ferrugineus, nitidus, pube aureâ erectâ vestitus; thorace brevi subtiliter, elytris distincte punctatis, his plus minusve saturate rufis; antennis testaceis, clavâ nigrâ, articulis precedentibus valde longiore, articulo ultimo elongato apice oblique truncato. Long. lin. $1\frac{3}{4}$—2.

About the size, but less convex than *R. coccinelloides*, Guerin. Thorax very short, base bi-sinuate, produced into a prominent lobe before the scutellum; this portion (and the scutellar region of the elytra) depressed, base and lateral margins bordered with a fine line, disc convex, basal sulci of the form usual in this genus of two fine arcuate lines parallel to the sides, and half the length of the disc. Elytra convex, thickly and finely punctured, separate punctures distinct under a strong lens, the whole upper surface clothed with a silky golden pile which reflects the light; in one of the two examples before me the disc of the elytra is unevenly clouded, the suture and margins being left paler, in the other the darker portions are only very indistinctly clouded. The antennæ are short, with the club strongly formed, the two penultimate joints being together equal in length to the preceding, and the terminal joint longer than the 10th, kidney-

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shaped, and with the apex externally and obliquely truncate, or rounded off. Club alone pitchy-black.

Hab.—Rio Janeiro; collected by A. Fry, Esq.

Obs.—This species is allied both to *hemisphæricus* and *coccinelloides*. From both it may be separated by its much shorter, more transverse and convex thorax, as well as by its thicker and longer pile.

Rhymbus decipiens, n. sp.

Ferrugineus, nitidus, pube aureo-flavâ micante vestitus, thorace brevi subtiliter, elytris sat fortiter punctatis; antennis articulis quinque ultimis nigris, clavâ articulis precedentibus sub-æquali, articulo ultimo sub-quadrato. Long. lin. $1\frac{1}{2}$—$1\frac{3}{4}$, ♂, ♀.

Very nearly allied to the preceding, but smaller; the antennæ are even shorter, owing to their much shorter club, which is not longer than the preceding eight joints; one or two joints before the club black, or nearly so. The elytra are more deeply punctured, and (in the four examples before me) are not clouded with any darker shade.

Hab.—Rio Janeiro; collected also by A. Fry, Esq.

Family ENDOMYCHIDÆ.

Genus PANOMŒA, Gerst.

Panomœa Borneensis, n. sp.

Rufo-ferruginea, hemisphærica, glabra; thorace maculâ transversâ basali, scutello, elytris maculis sex magnis, abdominisque segmento primo maculis duabus nigris, antennis totis rufis. Long. lin. 3—$3\frac{1}{2}$.

Allied to *P. pardalina*, Gerst., from which it differs as follows: the antennæ are entirely red, their third joint is rather longer, being more evidently longer than the fourth. The scutellum appears rather larger even in proportion to the larger size of the body; it is equilateral-triangular and only black in the central portion. The elytra want the humeral spot, the other six occupying the same positions as in *pardalina*. The first segment of the abdomen has near its middle two distinct transverse oval black spots; these spots are only visible in one of four examples of *pardalina* which are in my collection, in the less fully coloured specimens they are quite absent, and in one represented by an indistinct cloud which extends to the second segment. Form and puncturing of both upper and under side similar in both species.

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Hab.—Borneo. Four specimens, apparently females, Coll. Fry.

Genus ENDOMYCHUS, Panzer.

Endomychus bicolor, n. sp.

Niger, nitidus, glabratus, elytris abdomineque rufis. Long. lin. 2½, ♂.

Shining, head and thorax black, impunctate, sides of the latter not so narrowed from the base as usual in this genus, rounded in to the front angles, which are deflexed but little prominent; hind angles a little acute. Antennæ (deficient of the five terminal joints) black; third joint a little longer than second, fourth, fifth or sixth, which are equal inter se. Elytra rufo-castaneous, shining, minutely but thickly punctured, meso- and meta-sterna and legs black; abdomen (with six segments visible) red, the whole of the underside with very small punctures.

Hab.—India. Coll. Fry.

Obs. 1.—In the single specimen of this insect the antennæ are gone, excepting the six basal joints. I have very little doubt about its being a true *Endomychus*, and it is interesting to find the genus distributed so far. I have a specimen of *E. coccineus* from Northern India.

Obs. 2.—Six segments of the abdomen being visible in both sexes in *Endomychus*, the sex of my insect is doubtful.

LIST OF SPECIES DESCRIBED.

Trycherus longanimis	West Africa, Old Calabar, &c.
„ Fryanus	West Africa, Angola.
Eumorphus Fryanus	Malacca.
Corynomalus vexillarius	Ecuador, Peru.
„ maculicollis ..	Peru.
„ felix	Peru.
Epipocus mollicomus	Mexico.
Epopterus dilectus	Ecuador.
Ephebus depressus	Rio Janeiro.
„ ignobilis	Cayenne.
Stenotarsus macroceras	Columbia, Nova Grenada, Ecuador.
„ scymnoides	Rio Janeiro.
„ pantherinus	Malacca.
„ punctato-striatus ..	Old Calabar.
Rhymbus Rhizobioides	Rio Janeiro.
„ decipiens	Rio Janeiro.
Panomœa Borneensis	Borneo.
Endomychus bicolor	India.

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III. *Descriptions of new genera and species of* Phytophaga. By Joseph S. Baly, F.L.S.

[Read 15th March, 1875.]

Fam. CHRYSOMELIDÆ.

Genus Eumela.

Corpus oblongo-ovatum, valde convexum. *Caput* declive; *antennis* corporis dimidio fere æqualibus, modice robustis, extrorsum paullo incrassatis, leviter compressis; *palpis* maxillaribus articulo ultimo apice truncato, penultimo breviori, illo paullo angustiori. *Thorax* transversus, apice excavatus, lateribus fere rectis, non incrassatis. *Elytra* thorace multo latiora, valde convexa, confuse substriatim punctata; limbo inflexo obliquo. *Pedes* robusti; *tarsis* articulo tertio integro, *unguiculis* inermibus. *Prosternum* angustum; *acetabulis* anticis apertis. *Mesosternum* triangulare. *Metasternum* antice utrinque marginatum, processu antico apice immarginato.

Type, *Chrysomela cyanicollis*, Hope. India.

Eumela somewhat resembles *Sphærolina* in general form, but is more oblong and less convex, and differs also in the length and shape of the antennæ; from *Chrysomela* it is separated by the peculiar form of the thorax, and by the immarginate apex of the metasternal process.

Genus Mesoplatys.

Corpus anguste oblongum, parallelum, modice convexum. *Caput* modice exsertum, declive; *antennis* corporis dimidio brevioribus, subfiliformibus, articulis quinque ultimis leviter incrassatis; *palporum maxillarium* articulo ultimo conico, subacuto. *Thorax* transversus, lateribus non incrassatis. *Elytra* thorace vix latiora, parallela, confuse punctata. *Pedes* robusti, simplices; *tibiis* quadrangulatis, lateribus planis. *Prosternum* angustum, postice ad mesosternum vix extensum; *acetabulis* anticis late apertis. *Mesosternum* sat magnum, horizontale, planum, margine antico elevato, postice late truncato. *Metasternum* anguste marginatum, utrinque lineâ obliquâ impres-

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sum. *Abdominis* segmentum basale magnum, processu basali late truncato.

Type, *Chrysomela cincta*, Oliv. Senegal.

Mesoplatys—founded on species erroneously placed by Vogel under *Entomoscelis* (a genus with which they have not the slightest affinity)—may be easily separated from *Chrysomela* by the conical apical joint of the maxillary palpus; by the narrow, short prosternum, which scarcely reaches the mesosternum; by the peculiar form and raised anterior margin of the latter segment, and by the oblique groove on either side of the surface of the metasternum: the metasternal epiplures are also slightly dilated posteriorly.

Genus Carystea, Baly.

With deference to the opinion of the learned continuator of Lacordaire's genera, who has sunk the above genus into *Chrysomela*, I still think that it ought to be retained. In addition to the characters given in my diagnosis, there is still another important one, overlooked by me at the time, and subsequently also by Dr. Chapuis, which distinctly separates the two genera. In all the species of *Chrysomela* proper the apex of the metasternal process is regularly margined. In *Carystea*, on the other hand, this process is impressed on either side by a deep groove, but the apex itself is immarginate.

Fam. HALTICIDÆ.

Genus Eutrea.

Corpus subelongatum, pube adpressâ submetallicâ dense vestitum. *Caput* valde exsertum; *antennis* 11-articulatis, filiformibus; *oculis* magnis, prominentibus, rude granulosis; *carinâ* elevatâ; *encarpis* tumidis, contiguis. *Thorax* subcylindricus, dorso depressus, lateribus fere obsoletis. *Elytra* anguste oblonga, thorace multo latiora, crebre punctata. *Pedes: coxis* anticis erectis, apice fere contiguis, prosterno multo altioribus; *femoribus* posticis valde incrassatis; *tibiis* anticis quatuor spinâ parvâ armatis: *posticis* apice bispinosis; *unguiculis* appendiculatis. *Prosternum* angustissimum, apice transversim dilatatum; *acetabulis* anticis integris. *Mesosternum* angustum,

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elongatum, apice emarginatum. *Metasternum* magnum, tumidum.

Type, *Eutrea Bowringii.*

Eutrea and *Xenaltica* (described below) are the only two forms of *Halticinæ* known to me in which the apices of the hinder pair of tibiæ are armed with a double spine; all other genera belonging to the group (*Nonarthra* excepted, where the spine is obsolete, the margin of the apex being bordered by a row of small teeth) are furnished only with a single spine.

Eutrea Bowringii.

Elongata, convexa, picea, pube adpressâ, hic illic (luce mutante) chalceo-micanti, dense vestita; antennarum basi, pedibus anticis quatuor et tibiis tarsisque posticis obscure fulvis.

Long. 1½ lin.

Hab.—Hongkong; collected by Mr. Bowring.

Body elongate, densely covered with adpressed silvery hairs, which, seen in certain lights, have a brassy reflection. Head exserted far beyond the eyes, the latter large, coarsely granulose; labrum and clypeus rufo-piceous; vertex finely rugose. Thorax scarcely broader than long; sides straight and parallel, slightly sinuate behind the anterior angle, very narrowly margined; upper surface subcylindrical, flattened on the disk, finely rugose, closely covered with decumbent silvery hairs. Elytra much broader than the thorax, oblong, moderately convex, slightly depressed below the basilar space; whole surface rugose, closely covered with adpressed hairs, which are arranged in patches with their apices directed different ways, so that the metallic lustre varies according to the position in which the insect is viewed. Body beneath less densely clothed with hairs than the upper surface.

Genus Xenaltica.

Corpus subelongatum aut oblongum, convexum. *Caput* modice exsertum; *antennis* 11-articulatis, filiformibus; *carinâ* lineariformi; *encarpis* distinctis, medio contiguis. *Thorax* transversus, ante basin leviter transversim impressus, basi utrinque sulco brevi longitudinali instructo; lateribus reflexo-marginatis. *Elytra* oblonga, modice convexa, infra basin transversim excavata, confuse punctata.

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Pedes: coxis anticis transversis, non contiguis; *femoribus* posticis incrassatis; *tibiis* anticis quatuor apice spinâ parvâ armatis; *tibiis* posticis bispinosis; *unguiculis* appendiculatis. *Prosternum* anguste oblongum, apice leviter ampliatum; *acetabulis* anticis apertis. *Mesosternum* transversum, apice concavum.

Type, *Xenaltica Murrayi.*

Although agreeing with *Eutrea* in possessing a double spine at the apex of the hinder tibiæ, the present genus differs so completely in all other characters, that it is not necessary to point them out. In facies it closely resembles *Ædionychis* and allied genera, but is separated from them not only by the double spine of the hinder tibiæ, but also by each of the four anterior tibiæ being armed with a small spine.

Xenaltica Murrayi.

Subelongata, modice convexa, nigra, nitida; abdomine flavo.

Long. 4½ lin.

Hab.—Old Calabar.

Head moderately exserted; antennæ filiform, half the length of the body, first joint moderately thickened, second short, third longer than the fourth, fifth nearly equal in length to the third; epistome large, triangular, transversely elevated between the eyes; extreme apex strongly punctured; carina narrow, linear; encarpæ subovate, narrowed above; vertex smooth, separated from the encarpæ by a transverse groove. Thorax twice as broad as long, sides nearly parallel, straight at the base, slightly rounded in the middle, then nearly straight to the apex; anterior and posterior angles acute, the former curved distinctly outwards, lateral margin reflexed; disk moderately convex, impressed at the base on either side with a short slightly curved longitudinal groove, and between them with a faint ill-defined transverse sulcation; surface finely and remotely punctured. Scutellum subtrigonate, its apex broadly rounded. Elytra oblong, transversely excavated below the basilar space, the latter on each elytron distinctly raised; humeral callus thickened; surface finely and subremotely punctured.

Xenaltica picea.

Oblongo-ovata, convexa, pallide picea, nitida, antennis (basi exceptâ) nigris; thorace sat fortiter punctato, lateri-

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bus subangulatis; elytris obscure piceis, distincte punctatis, utrisque spatio basilari elevato, fere impunctato.

Long. 4 lin.

Hab.—Madagascar.

Head subquadrate; epistome thickened, transversely sulcate just behind the anterior margin, the sulcation narrowly interrupted in the middle; anterior border notched on either side close to the outer angle; encarpæ separated from the front by a deep transverse depression, trigonate, contiguous above, separated below by the apex of the epistome; antennæ rather more than half the length of the body, moderately robust. Thorax more than twice as broad as long; sides distinctly margined, bisinuate behind the middle, the latter obtusely angulate; posterior angles produced, acute, anterior obliquely truncate; upper surface coarsely but not closely punctured, transversely excavated just behind the anterior border; basal groove more distinct than in *Xenaltica Murrayi*, extending the whole length between the longitudinal sulci, the latter ill-defined. Elytra broader than the thorax, convex, distinctly and somewhat strongly punctured, the punctures less coarse than those on the thorax; each elytron depressed along the suture and also transversely below the basilar space, the latter distinctly raised, nearly impunctate; humeral callus thickened.

Genus Euphitrea.

Corpus rotundatum, convexum. *Caput* breve; *antennis* 11-articulatis, filiformibus, articulo secundo brevi, tertio illo vix longiori; *oculis* modice prominulis; *encarpis* obliquis, non contiguis; *carinâ* obsoletâ. *Thorax* transversus. *Elytra* thorace latiora, confuse punctata, limbo inflexo concavo. *Pedes* modice robusti; *coxis* anticis vix elevatis; *femoribus* posticis modice incrassatis; *tibiis* posticis non aut vix canaliculatis, apice spinâ acutâ armatis; *tibiis* anticis quatuor muticis; *unguiculis* appendiculatis. *Prosternum* coxis fere æquialtum, dorso canaliculatum, apice transversim dilatatum; *acetabulis* anticis integris. *Mesosternum* breve, erectum, metasterni apice occultum. *Metasternum* inter mesocoxas ad prosterni marginem productum.

Type, *Euphitrea Wallacei*.

Euphitrea resembles in general form and colour the

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European genus *Sphæroderma;* it is separated, however, very readily by the structure of the sternum.

Euphitrea Wallacei.

Subrotundata, valde convexa, fulva, nitida, mandibulis apice oculisque nigris, antennis corporis dimidio æqualibus, thorace minute punctato, elytris confuse tenuiter punctatis.

Var. A. Minor, picea.

Long. 4—4½ lin.

Hab.—Sumatra, Java; var. A. Tringanee.

Head short; epistome transversely trigonate, sinuate on either side; encarpæ oblique, narrowly oblong, not contiguous; front with its lower end more or less angulate, sometimes obtuse, divided from the encarpæ by a distinct groove; it is also sharply bounded on either side by a broad sulcation, which separates it from the eye; surface of front and vertex impunctate. Thorax more than twice as broad as long; base bisinuate on either side; medial lobe broadly truncate; sides rounded, nearly straight and parallel behind the middle, converging in front, all the angles acute, the anterior produced slightly outwards; upper surface very minutely and somewhat remotely punctured. Scutellum semiovate, its apex acute. Elytra broader than the thorax, shoulders rounded; upper surface more distinctly but not more closely punctured than the thorax.

Euphitrea micans.

Subrotundata, convexa, fulva aut fulvo-picea, nitida, mandibulis apice oculisque obscure nigris; thorace tenuiter punctato, basi utrinque lineâ brevi perpendiculari impresso, lateribus rotundatis, angulis posticis fere obsoletis, anticis acutis; elytris basi thorace multo latioribus, lateribus infra humeros ad apicem rotundato-angustatis; supra æneo-micantibus, distincte punctatis.

Long. 3 lin.

Hab.—Java, Sumatra, Malacca.

Head deeply immersed in the thorax; antennæ scarcely half the length of the body, third joint distinctly longer than the second; labrum impressed with a single row of small foveæ; epistome transversely trigonate, its apex obtuse; encarpæ linear, remote; front raised, its anterior apex rounded, its sides sharply defined, bounded on either

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side by a large depression, bordering the eye. Thorax more than twice as broad as long; base bisinuate on either side, medial lobe obtusely rounded; sides rounded, converging in front; anterior angles acute, posterior nearly obsolete; disk finely punctured, impressed on either side at the base by a short longitudinal groove. Elytra much broader at the base than the thorax; shoulders more prominent than the former species, rounded; sides rounded and converging from before the middle to the apex, the latter conjointly rounded; disk distinctly punctured.

Genus XANTHOCYCLA.

Corpus subrotundatum, valde convexum; *caput* breve, thorace fere immersum; *carinâ* et *encarpis* obsoletis; *oculis* subprominulis, remotis, rude granulosis; *antennis* filiformibus, 11-articulatis. *Thorax* transversus. *Elytra* thorace paullo latiora, punctato-striata. *Pedes: coxis* anticis prosterno paullo altioribus, transverso-ovatis; *femoribus* posticis valde incrassatis; *tibiis* anticis quatuor apice muticis; *tibiis* posticis brevibus, a basi ad apicem incrassatis, paullo remotis, dorso canaliculatis, apice spinâ validâ armatis; *unguiculis* appendiculatis. *Prosternum* oblongum, apice abrupte transversim dilatatum; *acetabulis* anticis vix apertis. *Mesosternum* parvum, metasterni apice occultatum. *Metasternum* inter mesocoxas ad prosternum productum.

Type, *Xanthocycla Chapuisii.*

Xanthocycla somewhat agrees with *Euphitrea* in the structure of the meso- and meta-sterna, but differs in the form of the hinder tibiæ and in the punctate-striate elytra.

Xanthocycla Chapuisii.

Subrotundata, valde convexa, fulva, nitida, oculis nigris, capite thoraceque crebre punctatis, obsolete rugulosis; elytris punctato-striatis, interstitiis crebre punctatis.

Long. 2½ lin.

Hab.—India.

Head rather broad, short, face flat, sutural lines marking out the epistome, the carina and the encarpæ entirely obsolete; antennæ scarcely half the length of the body, rather slender. Thorax much more than twice as broad as long, basal margin oblique and bisinuate on either side,

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medial lobe distinctly produced, rounded; sides rounded, converging from base to apex; hinder angle acute, anterior curved slightly outwards, its apex obtuse; upper surface transversely convex, closely and rather coarsely, but not deeply punctured, faintly rugulose, interspaces granulose-punctate; scutellum small, triangular; elytra strongly punctate-striate, interspaces finely but distinctly punctured.

Genus Rhypetra.

Corpus elongato-ovatum, convexum, subnitidum. *Caput* modice exsertum; *antennis* 11-articulatis, filiformibus, corporis dimidio longioribus; *carinâ* distincte elevatâ; *encarpis* distinctis; *oculis* sat magnis, prominulis. *Thorax* transverso-qnadratus, lateribus fere rectis, angulis distinctis; disco ante basin lineâ transversâ, utrinque ad marginem basalem curvatâ, impresso. *Elytra* thorace latiora, ovata, convexa, longitudinaliter costata. *Pedes: coxis* anticis vix elevatis; *femoribus* posticis modice incrassatis; *tibiis* posticis apice spinâ acutâ armatis; *quatuor anticis* apice inermibus; *unguiculis* appendiculatis. *Prosternum* elongatum; *acetabulis* anticis late apertis. *Mesosternum* cuneiforme.

Type, *Rhypetra costata.*

Rhypetra costata.

Elongato-ovata, convexa, viridi-metallica, subnitida, thorace basi lineâ transversâ curvatâ impresso, granuloso, minute sed subremote punctato; elytris æneo-micantibus, utrisque quadricostatis, interspatiis transversim rugulosostrigosis.

Long. 3½ lin.

Hab.—Columbia.

Head triangular, face elevated between the eyes, carina linear, ill-defined, encarpæ pyriform, their lower halves separated by the apex of the carina; antennæ more than two-thirds the length of the body. Thorax about one-fourth broader than long; sides straight, slightly converging near the apex; posterior angles acute, anterior subacute; upper surface somewhat flattened, closely granulose. Elytra oval, each with four broad longitudinal costæ, interspaces coarsely rugulose-striate.

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Genus Paradibolia.

Corpus ovato-rotundatum. *Caput* breve, thoraci in totum insertum; *antennis* filiformibus, 11-articulatis; *carinâ* male definitâ; *encarpæ* distinctæ; *oculis* magnis, subreniformibus, planis, apice fere contiguis. *Thorax* transversus, lateribus fere rectis, a basi ad apicem convergentibus. *Elytra* thorace vix latiora, confuse punctata, obsolete sulcato-striata. *Pedes: coxis* anticis transversis, prosterno æquialtis; *femoribus* posticis valde incrassatis; *tibiis* quatuor anticis apice muticis; *tibiis* posticis dorso canaliculatis, apice spinâ latâ, apice truncatâ armatis; *unguiculis* appendiculatis. *Prosternum* elevatum, antrorsum productum, postice rotundatum, non dilatatum; *acetabulis* anticis late apertis. *Mesosternum* obliquum, apice concavo-marginatum, prosterno fere occultatum. *Metasternum* inter mesocoxas fere ad prosternum protensum, mesosterni apici insertum.

Type, *Paradibolia indica.*

Paradibolia is very closely allied to *Dibolia*, but may be at once known by the very large subcontiguous eyes aud by the short subrotundate form.

Paradibolia indica.

Subrotundata, convexa, nitida, subtus fulva, supra viridi-cærulea, metallica, facie inferiori antennisque fulvis; elytris tenuiter crebre punctatis, striis nonnullis obsolete sulcatis instructis.

Long. 2 lin.

Hab.—India.

Head small, rotundate, completely buried in the thorax; encarpæ trigonate, contiguous above; front narrow, wedge-shaped; eyes very large, flat, somewhat kidney-shaped, nearly contiguous at the apex; antennæ half the length of the body. Thorax more than twice as broad as long, subcylindrical, finely rugose-punctate, nitidous. Elytra finely rugose-punctate, obsoletely sulcate-striate.

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IV. *Descriptions of new species of Indian Aculeate* Hymenoptera, *collected by* Mr. G. R. James Rothney, *Member of the Entomological Society.* By Frederick Smith.

[Read 15th March, 1875.]

Twenty-six new species of Indian *Hymenoptera* are described in this paper, and of four or five described species the sex, hitherto unknown, is added. Guérin-Méneville, in the Iconographie du Règne Animal, described an aberrant species of ant, belonging to the family *Cryptoceridæ*, naming it *Cryptocerus bicolor*; this was a worker, the male and female being at that time unknown. In 1853 I published, in the Transactions of this Society, a revision of the family, finding it necessary to establish two new genera; to one of these, *Meranoplus*, I transferred Guérin's species, which came from Pondicherry. Mr. Rothney found the insect in the Botanic Gardens at Calcutta. The nests he describes as difficult to find. Finding a few, however, he visited them almost daily for some months. They are made in the ground, at a depth of several inches. Not observing any other than workers at the mouths of the burrows, he determined to dig down and ascertain their contents. At the end of May, 1873, he succeeded in obtaining several males, but only one female. Whether more are to be found at any time remains undetermined. A second female was subsequently taken at Barrackpore. These are all that have rewarded a three seasons' industrious search. All the sexes are figured in the plate that illustrates this paper.

Another highly interesting insect, discovered by Mr. Rothney, is the female of *Pseudomyrma bicolor*, the winged female not having been previously discovered.

A new species of the genus *Methoca* is a valuable addition to the Indian *Mutillidæ*. Thirteen new species of fossorial *Hymenoptera* are here described—nine of *Andrenidæ*, and six of *Apidæ*. The most interesting insect among the species of *Andrenidæ* is one having capitate antennæ; it is closely allied to the genus *Nomia*, but is distinct, having only two submarginal cells in the anterior

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wings; the tongue is conformable to that of the species belonging to the genus *Nomia*, and the posterior legs of the males are swollen and curved as in that genus. We are now acquainted with five species of bees, the males of which have capitate antennæ: they are *Nomia Kirbii*, Sm.; *Nomia antennata*, Sm.; *Thaumatosoma Duboulaii*, Sm.; *Tetralonia mirabilis*, Sm.; and *Cyathocera nodicornis*.

A * is prefixed to the species of which the types are in the National Collection.

CRYPTOCERIDÆ.

Genus MERANOPLUS, Smith.

Meranoplus bicolor, Smith, Trans. Ent. Soc. Lond. 2nd ser. ii. 224, 1, ♀ (1853); Cat. Hym. Ins. pt. vi. Formicidæ, 193.

Cryptocerus bicolor, Guér. Icon. Règ. Anim. 425, ♀ (1844). (Pl. I., figs. 1♂, 2♀, 3♀, 1*a*♂, 2*a*♀.)

Female.—Length 3½ lines. The head, antennæ, thorax and nodes of the petiole of the abdomen ferruginous. Head rugulose, with confluent punctures, which run into longitudinal reticulation; the scape of the antennæ slightly fuscous above. The thorax with confluent punctures; a fuscous spot on the mesothorax anteriorly; also a similar lateral spot near the tegulæ; wings flavo-hyaline; the nervures testaceous; the stigma fuscous; the legs rufo-piceous; the tibiæ and femora darkest. Abdomen thinly covered with short pale pubescence, and having a few longer hairs intermixed, particularly towards the apex.

Male.—Length 2 lines. Head and abdomen nigro-piceous; the thorax rufo-piceous; the region of the scutellum more or less fuscous; the ocelli large, prominent, and of a pale glassy brightness; the antennæ and legs pale testaceous; wings flavo-hyaline; nervures and stigma pale testaceous; the abdomen with a very sparing, scattered, pale pubescence.

Hab.—Eden Gardens, Calcutta.

To Mr. Rothney science is indebted for the discovery of the male and female sexes of *Meranoplus bicolor*. With great care and labour they were dug out of the nest in the solid ground, but only one of each sex was secured.

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Pseudomyrma bicolor. (Pl. I., fig. 4.)

Pseudomyrma bicolor, Guér. Icon. Règ. Anim. 427, ♀; Smith, Cat. Hym. Ins. pt. 6, Formicidæ, 153; Trans. Ent. Soc. Lond. new ser. iii., 157, ♀.

Sima rufo-niger, Roger, Berl. Ent. Zeitschr. vii. 1864.

Female.—Length 5 lines. The head, femora, intermediate and posterior tibiæ and the abdomen black; the antennæ, mandibles, tarsi, anterior tibiæ and base of the two following pairs pale ferruginous; the thorax and two nodes of the abdomen ferruginous; the anterior wings fusco-hyaline; the posterior pair clear hyaline; the nervures of the anterior pair fuscous, palest at the base of the wings; the stigma dark fuscous. For the neuration, see the figure in plate.

Roger separated this insect from the genus *Pseudomyrma*, creating the genus *Sima* for its reception; but, in my opinion, on insufficient generic characters. Finding on comparison with six species of *Pseudomyrma*, some of which are retained in that genus by Roger, that the neuration of the wings in *P. bicolor* is identical with the others, I do not adopt the proposed generic name. The male of this species is unknown to me.

Mutillidæ.

Methoca orientalis.

Male.—Length 3¼ lines. Black and shining; wings hyaline; the nervures and stigma black. Antennæ as long as the head and thorax, thickened in the middle; the face closely punctured, the vertex more sparingly so; the mandibles rufo-piceous; the palpi pale testaceous; the entire insect with a thin, scattered, griseous pubescence, particularly the head and thorax. Thorax: the pro- and meso-thorax anteriorly with fine, rather distant punctures; the posterior portion of the mesothorax with transverse, somewhat coarse striæ; the metathorax rugose; the tarsi obscurely testaceous. Abdomen very smooth and shining; the margins of the segments constricted.

This insect closely resembles the *Methoca ichneumonoides* of Europe; but its antennæ are thicker, and the transverse striation of the mesothorax distinguishes it. It is the first species of the genus I have any knowledge of from India.

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Tribe FOSSORES.

Scoliadæ.

Elis thoracica.

Tiphia thoracica, Fabr. Ent. Syst. Supp. 254, ♀.

Elis thoracica, Sauss. et Sichel, Cat. des Espèc. Scolia, 188, ♀.

Male.—Length 8 lines. Black, with dense cinereous pubescence; the first four segments of the abdomen with sparing pubescence of the same colour, and the apical margins of the segments fringed with the same; the three apical segments with black pubescence. The clypeus yellow, with a large triangular black spot, from which a short line runs to the anterior margin; the mandibles with their apex rufo-piceous. Thorax: the posterior margin of the prothorax yellow in the middle, not extending to the tegulæ; a slightly interrupted line at the base of the scutellum, a spot on the post-scutellum, the tibiæ outside and the femora at their apex yellow; the wings fulvo-hyaline, the nervures dark brown. The first segment of the abdomen yellow above, with the base and sides narrowly black; the second also yellow, with the base black; the black produced more or less in the middle into an angular shape, and continued obliquely at the sides towards the apical margin of the segment, but not reaching to it; the third segment is similarly coloured, but the black base is broader; the fourth has a narrow yellow fascia, sometimes slightly interrupted in the middle; the black colouring has more or less of a blue, green and violet tinge.

Elis hirsuta, Sauss. Cat. des Espèc. Scolia, 200, ♀.

Male.—Length 3¼—4½ lines. Black, the abdomen iridescent; the apical margins of the segments with yellow fasciæ. Covered with a thin cinereous pubescence; the mandibles and clypeus yellow; the latter with a black spot in the middle, and the former rufo-piceous at their apex; the antennæ fulvous beneath. The prothorax has a yellow line, which extends to the tegulæ; the scutellum and post-scutellum yellow; the apex of the femora and the tibiæ outside yellow; the tarsi rufo-testaceous; the wings hyaline, the nervures ferruginous. The fasciæ on the second and third segments widen abruptly laterally

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into large sub-ovate forms, the middle of the fasciæ being of equal width; all the segments with a long cinereous fringe; the apical segment ferruginous above.

The female of this species is described by Saussure in the Cat. des Espèc. Scolia, but he does not give the size, which varies in a series from three and a half to six lines; it is black and shining; its pubescence cinereous; the head convex, smooth and shining; the thorax strongly punctured; the scutellum impunctate; the legs very pilose; the wings hyaline, the nervures ferruginous; the first four segments of the abdomen fringed with white pubescence.

Pompilidæ.

Agenia festinata.

Female.—Length 5½ lines. Black, with a silvery pile, observable in certain lights; wings hyaline, with a fuscous cloud, which occupies the basal half of the marginal cell, and descends into the third discoidal cell. The head, below the insertion of the antennæ, covered with bright silvery pile; the mandibles rufo-piceous at their apex; the palpi obscurely testaceous. Thorax: the metathorax finely striated transversely; the wings hyaline; the anterior pair with a slight fulvous tint, and their apical margins slightly fuscous. Abdomen petiolated, the petiole short.

Priocnemis peregrinus.

Female.—Length 9½ lines. Black: the head, antennæ, pro- and meso-thorax, tegulæ and scutellum ferruginous; the legs of the same colour, except the coxæ, trochanters and extreme base of the femora, which are black; the mandibles ferruginous, with their tips black; the metathorax transversely striated, and with a longitudinal central channel; the wings brown, with a bright violet iridescence.

Male.—Length 6—7 lines. Closely resembling the female; but with the vertex of the head more or less fuscous, or black; the mesothorax and scutellum more or less obscure, sometimes quite black; the femora are also black, except towards their apex; three or sometimes four of the apical joints of the tarsi black; five or six of the apical joints of the antennæ black.

This insect was found at Calcutta, by Mr. Rothney; it also occurs in Sumatra and at Hong Kong.

Hab.—Barrackpore, &c.

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Mygnimia Atropos.

Male.—Length 6¼ lines. Black: mandibles and antennæ ferruginous; the latter more or less fuscous above. The thorax, in certain lights, with an obscure purple tinge; the anterior tibiæ and tarsi, and the extreme apex of all the femora, ferruginous; the wings blackish-brown, with a bright blue and violet iridescence; an obscure ocellated spot in the first discoidal cell; the metathorax with a few slight transverse carinæ. Abdomen slightly shining.

CRABRONIDÆ.

Trypoxylon accumulator.

Female.—Length 6½ lines. Black: the apex of the first, and the second and third segments entirely, ferruginous. Head: the palpi pale testaceous; the mandibles pale testaceous at their base and ferruginous towards their apex; the flagellum of the antennæ, except the two first joints, fulvous beneath; the clypeus and face, as high as the sinus of the eyes, covered with silvery-white pubescence. Thorax smooth and shining above; the metathorax with a deep central longitudinal fovea, which extends from the base to the apex, and is widest in the middle; the sides of the metathorax with a thin white pubescence, there is also a little on the thorax beneath and on the legs; the anterior and intermediate tarsi, the anterior tibiæ in front, the intermediate pair at their base and apex, and the posterior pair at their apex, as well as all the spurs of the tibiæ, pale rufo-testaceous; the base of the joints of the posterior tarsi pale; the wings hyaline, faintly clouded at their apex, the nervures black; the tegulæ rufo-testaceous. Abdomen smooth and shining.

Oxybelus squamosus.

Female.—Length 3 lines. Black, spotted and banded with yellow. Head: the scape in front and the mandibles yellow; the latter ferruginous at their tips; the antennæ fulvous; very closely punctured. Thorax shining, strongly, but not very closely punctured; an ovate spot on each side of the scutellum, and a squama beneath each on the post-scutellum, yellow; at the posterior margin of the latter is a larger squama of a bright red, coppery colour, notched at the apex; the anterior femora beneath,

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and the posterior tibiæ at their apex outside, yellow. The wings hyaline, their nervures ferruginous. Abdomen: a broad yellow band on the apical margins of the first four segments, all interrupted, the two first most widely so; shining and punctured.

Male.—Rather smaller, but very like the female; the tibiæ and tarsi yellow, and more or less ferruginous beneath.

Larridæ.

Astata agilis.

Female.—Length 3½ lines. Head, thorax and legs shining black; abdomen ferruginous, with the apex black. Head: the mandibles ferruginous in the middle; the face with a silvery-white pubescence; a little, thin, long pubescence of the same on the cheeks and hinder margin of the vertex. On the prothorax, anterior margin of the mesothorax, the sides of the thorax and also beneath, a thin, long, silvery pubescence; the metathorax above with divergent striæ, which are reticulated between, the apex truncate; wings hyaline, with a fuscous cloud beyond the stigma, the extreme apical margin pale; the tarsi rufo-piceous. The abdomen smooth and shining.

Hab.—Nischiudipore.

Nyssonidæ.

Gorytes amatorius.

Female.—Length 3¼ lines. Black, variegated with white and ferruginous. Head: the face as high as the insertion of the antennæ and the scape in front white; the mandibles ferruginous, the scape of the antennæ fulvous beneath; the cheeks and clypeus with a silvery pile. Thorax: a narrow line on the collar, the tubercles, a spot on the mesothorax close to the tegulæ and the post-scutellum white; the legs ferruginous, with the tibiæ, tarsi and the apex of the anterior and intermediate tibiæ beneath white; the tibiæ more or less ferruginous; the claw-joint of the posterior tarsi black; wings hyaline and iridescent. Abdomen: the basal segment ferruginous, black above towards the apex, and with a narrow, white, interrupted fascia on its apical margin; the three follow-

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ing segments with narrow white fasciæ, the first widened laterally; the third not extending to the lateral margins.

* *Gorytes tricolor.*

Female.—Length 4 lines. Head black, thorax ferruginous, both with yellow markings; abdomen of three colours—ferruginous, yellow and black. Head: the antennæ, anterior margin of the clypeus and tips of the mandibles ferruginous; the extreme apex of the antennæ black; the clypeus and mandibles, a short narrow line behind the eyes and a broader one at their inner orbits yellow, the latter ferruginous towards the clypeus. The prothorax above, a spot before the tegulæ, the scutellum and post-scutellum, the claw-joint of the anterior tarsi, and the intermediate and posterior tibiæ in front, yellow; the enclosed space at the base of the metathorax longitudinally striated; the legs ferruginous; the wings hyaline, with a dark fuscous spot occupying the marginal, second submarginal and a portion of the third submarginal cells. Abdomen: the two basal and the apical segment ferruginous; the third and fourth segments yellow, the fifth black; the first segment with a yellow margin at fascia, not extending to the lateral margins, and much narrowed in the middle; this band is sometimes obsolete; the second segment has a yellow marginal fascia, narrow in the middle and much widened laterally; the basal margin of the third segment black.

Male.—Greatly resembles the female, but has the scape of the antennæ, the mandibles, as well as the clypeus and inner orbits of the eyes, yellow; the coxæ, trochanters, tibiæ and tarsi are also yellow, the tibiæ being more or less ferruginous or black behind. The first four segments of the abdomen have a yellow fascia on their apical margins, greatly widened laterally; the third and following segments otherwise black.

* *Cerceris viscosus.*

Female.—Length 5 lines. Ferruginous, variegated with bright yellow, the tips of the anterior wings dark fuscous. Head: a large oblong spot behind the eyes, the clypeus, which is elevated, the face on each side of it, a line between the antennæ terminating in a round spot at the anterior ocellus, the scape in front and the mandibles

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yellow; the antennæ ferruginous. Thorax: an interrupted line on the collar, a spot on the tegulæ, two ovate ones beneath the wings, two minute ones on the scutellum, the post-scutellum and a line on each side of the metathorax, yellow; the legs yellow, the femora above and the apex of the tibiæ ferruginous. The first segment of the abdomen, and a central triangular spot which crosses the three following segments, ferruginous; the apical segment also ferruginous, otherwise yellow.

* *Cerceris rufinodis.*

Male.—Length 4⅛ lines. Black, variegated with yellow, the basal segment of the abdomen red; strongly punctured. Head: the front clypeus, scape in front, mandibles and a spot behind the eyes, yellow; antennæ fulvous, more or less fuscous above. Thorax: the collar, tegulæ, scutellum and post-scutellum, an oblong spot at the sides of the metathorax, two spots beneath the wings, one on the pectus, and the legs, yellow; a black spot at the base of the anterior and intermediate femora above; the apex of the posterior femora and tibiæ black, their tarsi fuscous; wings hyaline, with a dark fuscous stain at the apex of the anterior pair. The second and following segments of the abdomen with yellow marginal fasciæ, attenuated in the middle and sub-interrupted; the fasciæ continued beneath the abdomen, which is there rufo-testaceous.

* *Cerceris velox.*

Male.—Length 3—3½ lines. Black, variegated with yellow and ferruginous; the anterior wings with their apex dark fuscous. Head: the front, clypeus, mandibles and scape in front yellow; mandibles rufo-piceous at their apex; the collar, tubercles, tegulæ, scutellum and post-scutellum, the apex of the metathorax and the legs, yellow; the posterior femora and tibiæ black; the former sometimes slightly ferruginous beneath, the latter yellow at their base; the posterior tarsi rufo-testaceous; the base of the metathorax ferruginous, with the enclosed triangular space black. Abdomen: the first, second and fourth segments ferruginous; the second yellow at its base, then black, with the apical portion ferruginous; the fourth segment has the apical half black; the following segments with broad yellow fasciæ.

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Tribe ANTHOPHILA.

ANDRENIDÆ.

Nomia curvipes. (Pl. I. fig. 8.)

Andrena curvipes, Fabr. Ent. Syst. ii. 310, ♂.

Megilla curvipes, Fabr. Syst. Piez. 330, ♂.

Nomia curvipes, Oliv. Encycl. Méth. viii. 377, ♂.

Female.—Length 4½ lines. Black: antennæ and legs rufo-fulvous, abdomen with greenish-yellow fasciæ. Head: the antennæ more or less rufo-piceous above; the face with bright fulvous pubescence, with a golden tinge; the mandibles ferruginous, rufo-piceous at their apex. Thorax clothed above with fulvous pubescence; the legs rufo-fulvous; the coxæ, trochanters and posterior femora rufo-piceous; wings fulvo-hyaline, the nervures and tegulæ rufo-testaceous. Abdomen: the apical margins of the first four segments greenish-yellow, the two apical fasciæ widest.

The male closely resembles the female, but has an additional fascia on the abdomen, all are frequently yellow, as described by Fabricius, but in some examples the fasciæ are tinged with green; the scape of the antennæ is yellow in front; the posterior femora, which are incrassate, are rufo-piceous, with their apical half yellow, as are also the tibiæ and tarsi, the tibiæ having a rufo-piceous stain near their base.

Hab.—India, Nuddea, Punjaub.

This is certainly, I think, the *Andrena curvipes* of Fabricius, but I am doubtful of its being the *Eucera crassipes* of that author, who describes the pubescence of the head and thorax as "cinereo-hirta."

**Nomia oxybeloides.* (Pl. I. figs. 6 ♂, 6 *a*.)

Female.—Length 3 lines. Black; the pubescence silvery-white, the tegulæ large and of a reddish-yellow. Head closely punctured and shining, the face and cheeks with white pubescence; the flagellum of the antennæ more or less brightly fulvous beneath. Thorax shining, strongly and not very closely punctured; a transverse line of dense white short pubescence at the anterior and posterior margins of the mesothorax; the post-scutellum covered

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with the same; the pubescence on the legs of a glittering silvery whiteness, dense on the posterior tibiæ; the apical joints of the tarsi rufo-testaceous; the wings hyaline. Abdomen: the margins of the segments with silvery-white pubescent fasciæ.

Male.—Strongly resembles the female in general appearance; black, with the legs rufo-piceous, varying greatly in depth of colour in different specimens, occasionally pale rufo-testaceous. Head: the face with white pubescence, or sometimes yellowish-white; the flagellum of the antennæ ferruginous beneath. Thorax above covered with a fine yellowish-white tomentum, usually more or less abraded on the disk; the post-scutellum covered with the same; the scutellum naked and punctured; wings hyaline, faintly clouded at their apex; the tegulæ very large, of a reddish-yellow; all the tarsi whitish; the posterior femora incrassate, greatly swollen exteriorly towards their apex; the tibiæ curved, rufo-testaceous towards their base, from thence white to their apex, which is flattened, and greatly produced, the tarsi appearing to be inserted midway into the exterior margin of the tibiæ. Abdomen strongly punctured, the base pubescent; the apical margins of the segments impunctate and covered with a very short yellowish-white pubescence.

This species has been received from several localities in India. In the Museum are specimens from the Himalayas; only males were known until Mr. Rothney forwarded the sexes.

Hab.—Nischiudipore.

**Nomia aurifrons.*

Female.—Length 4 lines. Black: the antennæ beneath and the legs ferruginous; the tibiæ and tarsi palest; the femora and coxæ frequently rufo-piceous; the pubescence principally golden-yellow. The face and cheeks with golden pubescence, that on the cheeks palest. The mesothorax with a short, fine, fulvous pubescence; the post-scutellum and prothorax covered with pale yellow tomentum, the rest of the thorax and the legs with a pale glittering golden pubescence; wings fulvo-hyaline, faintly clouded at their apex; the nervures pale ferruginous. Abdomen, in some examples, slightly ferruginous at the base; the first segment has a fine, golden, short, downy pubescence at the base, and this and the following seg-

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ment have a narrow fascia, the other segments being covered with similar pubescence, but of a brighter colour.

Hab.—Silhet; Barrackpore.

**Nomia Elliotii.* (Pl. I. fig. 7.)

Female.—Length 4—4½ lines. Black: the abdomen with green or blue-green fasciæ on the apical margins of the abdominal segments. The head and thorax above slightly shining, and closely and very finely punctured. Head: the antennæ have the flagellum slightly fulvous at the apex beneath; the face and cheeks with white pubescence. Thorax: a narrow line of white pubescence at the anterior margin of the mesothorax, another at its apical margin, and the post-scutellum, which is armed with two spines, covered with the same; wings sub-hyaline, their apical margins faintly clouded; the exterior margin of the tegulæ pale testaceous, or sometimes white; the legs have a pale glittering pubescence, which is very bright on the basal joint of the tarsi outside and on the posterior tibiæ. Abdomen smooth and shining, with four bright green fasciæ.

Male.—Closely resembles the female; but has the posterior femora incrassate and greatly swollen, being thickest in the middle; the tibiæ curved and produced at their apex beneath into a fulvo-testaceous blunt process; this sex, as well as the female, has the scutellum emarginate posteriorly, the angles being acute or subdentate, and has also two spines on the post-scutellum.

Var. The posterior legs with the femora ferruginous in both sexes, but usually more or less black above.

Hab.—Madras; Barrackpore; Nischiudipore.

The male of this species has been in the Museum Collection for upwards of twenty years, during which time the name given has been attached; it was proposed in honour of the donor, but the description has not been published; Mr. Rothney has taken both sexes.

Nomia simillima. (Pl. II. fig. 4.)

Male.—Length 3½ lines. Black: the head and thorax rather finely punctured; the abdomen has a narrow greenish-white fascia on the apical margins of the first four segments; the posterior femora and tibiæ ferruginous. The face and cheeks with a silvery-white pubescence.

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Thorax: a line of white pubescence at the anterior and posterior margins of the mesothorax; the post-scutellum covered with the same; the scutellum emarginate behind, the lateral angles of the emargination sub-dentate; the post-scutellum armed with two acute spines; wings hyaline, with a faint cloud at their apex; the outer margin of the tegulæ pale testaceous; the posterior femora incrassate; the tibiæ curved, thickened and produced at their apex into a blunt process; the tarsi black, with the base of the first joint more or less ferruginous. The abdomen smooth and shining, rufo-testaceous beneath.

Very like *N. Elliotii*, but smaller and distinguished by the colour of the posterior legs.

Hab.—Barrackpore.

**Nomia scutellata.*

Female.—3 lines. Black: the pubescence cinereous except that on the thorax above, which is fulvous; the abdomen with white pubescent fasciæ. Head: the flagellum of the antennæ more or less fulvous beneath; the face and cheeks with bright white pubescence. Thorax: the disk with sparing short fulvous pubescence, becoming more dense towards the scutellum, on which it is dense and bright; the pubescence on the legs, sides of the metathorax and beneath cinereous; wings sub-hyaline; the nervures fuscous; the stigma and tegulæ pale ferruginous. The apical margins of the segments with white fasciæ, except the apical one, which has a dark fuscous fringe.

Hab.—Calcutta.

**Nomia thoracica.* (Pl. I. fig. 10.)

Female.—Length 4—5 lines. Black: the coxæ and femora rufo-piceous; the tibiæ and tarsi pale ferruginous, the anterior and intermediate tibiæ usually darkest; the first and three following segments of the abdomen above have narrow white margins. The head with pale glittering pubescence; the flagellum of the antennæ fulvous beneath. The pubescence on the disk of the mesothorax and scutellum very short, dense and fulvous; that on the post-scutellum is much paler, as it is also on the legs and thorax beneath; wings sub-hyaline; the nervures and tegulæ ferruginous; the costal nervure and stigma fuscous. Abdomen very finely and closely punctured.

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Male.—Closely resembles the female, but the legs are black with the tarsi rufo-piceous, the apical joints being palest; the posterior femora incrassate, being greatly swollen at their apex; the tibiæ curved, exteriorly much swollen and thickened gradually to their apex, which beneath is pale testaceous. Abdomen: the apical margins of the second and following segments narrowly white; punctured as in the female, but more pubescent at the sides and at the base.

Hab.—Barrackpore; China.

**Nomia antennata.* (Pl. I. figs. 9, 9*a*.)

Female.—Length 5½ lines. Black: the pubescence fulvous, which is more or less pale; the abdomen with fasciæ of the same. Head: the antennæ, except the scape and two basal joints of the flagellum, fulvous beneath; the face covered with pale, fulvous, short pubescence, which has a golden tint in certain lights; the cheeks and the legs are clothed with the same; on the mesothorax, above, the pubescence is rich fulvous; a line of short, paler pubescence on the post-scutellum; the wings hyaline, their apex, beyond the marginal cell, fuscous; the nervures ferruginous; the tarsi of the same colour. The apical margins of the four basal segments of the abdomen with fasciæ of pale fulvous pubescence.

Male.—The general colour and the pubescence as in the opposite sex; the antennæ as long as the head and thorax; the scape and the apical joint black, the latter enlarged and compressed into an irregular circular formation nearly thrice the diameter of the previous joint. The posterior legs have the femora greatly enlarged, the tibiæ curved and greatly dilated at and towards their apex. The abdomen with similar pubescent fasciæ to those on the female.

Hab.—India; Bombay Presidency.

This species does not form part of Mr. Rothney's collection, it was obtained from that of Captain Laing, and was taken near Lucknow; it is described from specimens in the British Museum, and is incorporated in this paper solely in consequence of its having capitate antennæ; it will be observed that the club is composed of a single joint; in the new genus, *Cyathocera*, it is two-jointed.

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Genus Cyathocera.

Head subovate, as wide as the thorax, the ocelli placed in a slight curve on the vertex; the maxillary palpi six-jointed, the basal joint stoutest, the joints gradually decreasing in width to the apical one, and also in length, but only slightly so; the labium short and lanceolate, the paraglossæ two-thirds of the length of the labium; the mandibles bidentate in the female, the teeth blunt; in the male they are edentate and acute at their apex. The wings with one oblong marginal cell, rounded at its apex, three submarginal cells, the second one-third longer than the first, receiving the two recurrent nervures, each at about one-fourth of the length of the cell, the tegulæ enlarged in both sexes; thorax ovate, the posterior legs have the femora fringed with pubescence beneath, and the tibiæ and basal joint of the tarsi furnished with a dense scopa; in the male the posterior legs have the femora enlarged and the tibiæ curved, with the apex dilated. Abdomen sub-ovate.

In the female the antennæ are short, filiform, with the terminal joint acute at the apex, not reaching to the tegulæ; the male has the antennæ elongate, reaching to the first segment of the abdomen, filiform, with the two apical joints dilated, compressed, forming a somewhat pear-shaped node, concave beneath or spatulate.

**Cyathocera nodicornis.* (Pl. I. figs. 5 ♂, 5*a*, 5*b*.)

Female.—Length 3¼ lines. Head, thorax, coxæ and basal margins of the third, fourth and fifth segments of the abdomen above black; legs and abdomen, otherwise, ferruginous. Head: antennæ ferruginous; the face as high as the ocelli, and the cheeks covered with bright gold-coloured pubescence; the clypeus naked and strongly punctured; tips of the mandibles rufo-piceous. The meso- and meta-thorax smooth and shining; the pro-thorax, a narrow line at the basal margin of the scutellum, the post-scutellum, and sides of the metathorax, have a covering of rich yellow tomentum; the legs have a pale, glittering, yellow pubescence; the wings subhyaline, and dark fuscous beyond the marginal cell; the tegulæ large and ferruginous. Abdomen: the second, third and fourth segments have laterally, in very fine examples, at their basal margins an oblong macula of white pubescence;

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these are usually more or less obliterated; the fourth and following segments covered with golden pubescence.

Male.—Agreeing with the other sex in size and general resemblance; the wings fuscous at their apex, the tegulæ proportionally larger. The antennæ a little longer than the head and thorax, ferruginous, with the two apical joints black, enlarged, flattened and forming a somewhat pear-shaped node or club. The posterior femora swollen, widest at their apex; the tibiæ have their apical half dilated, their inferior apex being compressed into a thin, rounded, flat plate. The apical margins of the segments of the abdomen strongly punctured, the entire abdomen being smooth in the female.

Of this remarkable genus two females were obtained by the British Museum from Captain Laing's collection; they were taken near Lucknow some time previous to 1870. Mr. Rothney captured both sexes near Pulta, Barrackpore; he reports the species to be extremely local. The plant it frequented appeared to be a species of *Pulicaria*.

Apidæ.

Cœlioxys argentifrons.

Male.—Length 4½ lines. Black: the head and thorax semi-opake and very closely punctured; abdomen shining, rather closely and finely punctured; wings slightly fuscous, becoming clear hyaline towards the base. The face densely covered with silvery-white pubescence; the cheeks, the thorax at the sides and beneath, the legs, and the abdomen beneath, have a fine, short, silvery-white pubescence; the segments of the abdomen have each a lateral patch of fine, short, white pubescence; the patches extend over both the basal and apical margins, they are widest laterally, and are attenuated to a point inwardly, and do not extend to the middle of the segments. The apical segment has a slender, acute tooth on each side at its base; the apex deeply notched or grooved, the lateral projections form short rounded teeth above, and short acute ones beneath, all being of the same length. The tooth at the lateral angles of the scutellum is very short and blunt.

Cœlioxys basalis.

Female.—Length 7 lines. Black: the abdomen shining, elongate and tapering to an acute point. The vertex,

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thorax above and the scutellum rugose; the sides and pectus strongly punctured; a stout acute tooth curved downwards at the lateral angles of the scutellum; the segments of the abdomen evenly and moderately punctured, most finely so at their basal margins; the apical segment smooth and lanceolate at its apex; the inferior valve narrower, more acute, and extending a little beyond the upper one. The wings hyaline to one-third of their length from the base, beyond which they are dark fuscous. The face covered with snow-white pubescence, that on the clypeus is downy and fulvous along the anterior margin; the margins of the abdominal segments with a narrow white pubescent fringe, which slightly widens laterally.

Male.—Length 5—5½ lines. Closely resembles the female; the clypeus has not any fulvous pubescence at its anterior margin, but, as well as the face, is densely covered with white pubescence; the head is a little wider than the thorax; the wings as in the female; the apical segment has the upper valve armed with eight teeth, a short acute one on each side at its base, a deep notch or short groove at the apex, in the middle, forms two other somewhat blunt teeth, beyond these the margin terminates on each side in a short acute tooth; the apex beneath these four teeth terminates in two longer acute teeth or spines.

The general resemblance of these sexes quite warrants their being united as constituting one species.

Cælioxys cuneatus.

Female.—Length 5 lines. Black, shining and punctured; the abdomen with narrow white uninterrupted abdominal fasciæ. Head and thorax strongly punctured; the face and cheeks covered with white pubescence. Thorax: a small spot of white pubescence at the anterior margin of the mesothorax, two at the basal margin of the scutellum, and also a minute one behind the tegulæ; the sides and beneath as well as the legs with fine, short, white pubescence; a short blunt tooth at the lateral angles of the scutellum; the wings slightly fuscous, becoming hyaline towards their base. Abdomen wedge-shaped, gradually tapering from the base to the apex; the marginal fasciæ widest laterally and continued on the margins beneath.

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Cœlioxys confusus.

Female.—Length 4—5 lines. Black: the head and thorax strongly and closely punctured, the abdomen much more finely and less closely so, the apical segment smooth, the sides punctured towards the apex; the wings fuscous beyond the first submarginal cell, their basal portion hyaline; the face and also the cheeks covered with white pubescence; the thorax at the side and beneath and also the legs have a fine, thin, white pubescence; a short rather blunt tooth at each lateral angle of the scutellum; a narrow white marginal fascia on the margins of the segments of the abdomen; it is slightly widened at their sides. The apex of the apical segment acute; the lower valve of the segment is also acute and extends a little beyond the upper valve, which has a central carina, that runs from the apex half-way towards the base.

This species, although distinct from, is very like *C. fuscipennis*, also from India, but its apical segment is very much narrower. In *C. fuscipennis* it is somewhat spoon-shaped.

Nomada adusta.

Female.—Length 3 lines. Ferruginous, with black and yellow markings; wings hyaline, the anterior pair fuscous at their tips. Head: the clypeus and face, as high as the insertion of the antennæ, yellow. Thorax: the scutellum, post-scutellum, the tubercles and collar yellow. Abdomen: a black spot on each side of the basal segment, its apical margin fusco-ferruginous; the second segment with a broad, sub-interrupted, yellow fascia at its basal margin; the rest of the segment, as well as the following segments, dark rufo-piceous; the third segment has a yellow fascia on its apical margin; the following segment has two large united yellow maculæ; the apical segment covered with silvery-white pubescence.

The male resembles the female, but its general colouring is darker, the thorax being black with ferruginous stains; the antennæ dark fuscous above.

Anthidium rasorium.

Female.—Length 2¾ lines. Black: an interrupted yellow fascia on each abdominal segment; the legs, and abdomen beneath, ferruginous. Head very closely and finely punctured; the clypeus, face as high as the insertion

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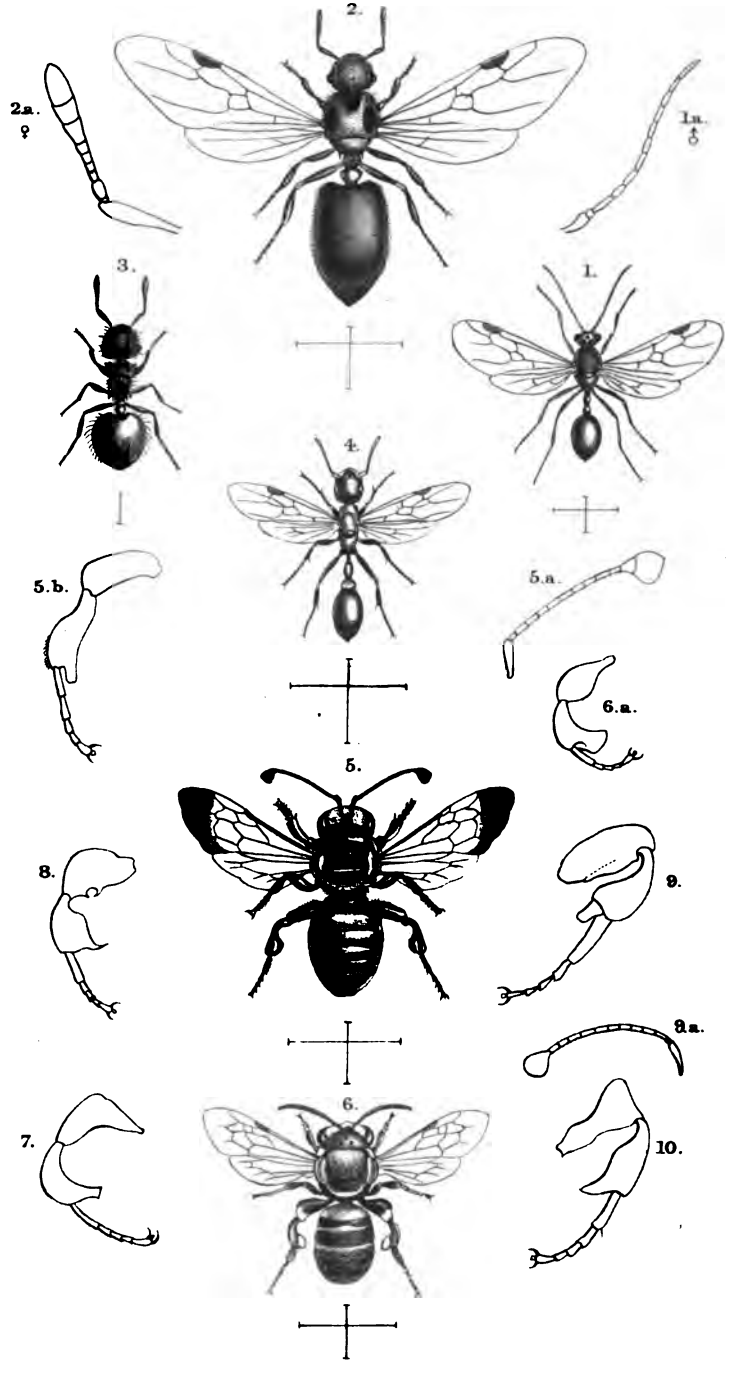

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of the antennæ, a spot on the mandibles and a line behind the eyes, and on the margin of the vertex, white. Thorax very closely punctured; a yellow line passes over the tegulæ and runs on to the posterior margin of the scutellum; wings hyaline and iridescent, the tegulæ rufo-testaceous; the basal joint of the posterior tarsi cream-coloured. The head, thorax and legs with short cinereous pubescence. Abdomen: a yellow fascia in the middle of each segment; that on the first only commenced at the sides, the second widely interrupted, the rest narrowly so; the sixth with a large cordate-shaped spot; clothed beneath with pale fulvous pubescence.

Male.—Closely resembles the female; the face has the white colouring extended above the insertion of the antennæ, a spot in front of the anterior ocellus, and the mandibles, white; the anterior margin of the mesothorax with an interrupted white line; the tegulæ in front, the tubercles and a white stripe passing from them down the sides and also beneath the thorax, the legs also striped with white; the fasciæ on the abdomen scarcely interrupted.

Hab.—Barrackpore; Bombay Presidency.

Mr. Rothney found this insect at Barrackpore; Dr. Leith took it in the latter district.

DESCRIPTION OF PLATE I.

1. *Meranoplus bicolor*, ♂. 1*a*. Antenna of ditto.
2. „ „ ♀. 2*a*. „
3. „ „ ☿.
4. *Pseudomyrma bicolor*, ♀.
5. *Cyathocera nodicornis*, ♂. 5*a*. Antenna of ditto. 5*b*. Posterior leg of ditto.
6. *Nomia oxybeloides*, ♂. 6*a*. Posterior leg of ditto.
7. Posterior leg of *Nomia Elliotii*, ♂.
8. „ „ *curvipes*, ♂.
9. „ „ *antennata*, ♂.
10. „ „ *thoracica*, ♂.

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V. *Descriptions of new species of Bees belonging to the genus* Nomia *of Latreille.* By Frederick Smith.

[Read 15th March, 1875.]

Upwards of twenty years ago a monograph of this genus was in preparation by Professor Westwood; circumstances have retarded its completion; several species in the National Collection were at that time described, the manuscript names being published in the British Museum Catalogue of Hymenopterous Insects in 1853; since that time several of the species have been described by myself in the series of papers descriptive of the *Hymenoptera* of the Eastern Archipelago, which were published in the Proceedings of the Linnean Society. In this paper thirty-eight species are described, and seven in the paper on Indian *Hymenoptera*, making a total of forty-five. The species, the types of which are in the National Collection, are distinguished by the prefix of a *. Figures of the legs of the males of the two most common European species are given, one being that of the type of the genus; the synonymy of those species is also added. All the figures of the posterior legs of the males represent them as when viewed exteriorly; consequently, in some instances, spines on their inner margin are not visible. All sizes of the species are given in French lines.

Nomia diversipes. (Pl. II. fig. 1, ♂.)

Nomia diversipes, Latr. Gen. Crust. et Ins. iv. 155, ♂; Oliv. Encycl. Méth. vii. 376; St. Farg. Hym. Hist. Nat. des Ins. ii. 293, ♂. (Type.)

Nomia humeralis, Duf. Ann. Soc. Ent. Fr. viii. 584; Costa, Faun. del Reg. di Napoli, Hym. i. 6, tab. xxxi. fig. 2, ♂, tab. 31 *a*, fig. 1, ♀.

Hab.—France; Italy.

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Nomia difformis. (Pl. II. fig. 2, ♂.)

Lasius difformis, Panz. Faun. Ins. Germ., Fas. 89, tab. 15, ♂; Jurine, Hym. 238.

Nomia difformis, Latr. Gen. Crust. et Ins. iv. 155, ♂; Eversm. Bull. Mosc. xxv. 11; Schenck, Die Bienen Nassau, 397.

Andrena humeralis, Jurine, Hym. pl. 14, fig. 6, ♀ ?

Nomia monstrosa, Costa, Faun. del Reg. di Napoli, Hym. i. tab. xxxi. fig. 1, ♂.

Hab.—France; Italy; Germany; S. Russia.

*1. *Nomia capitata.*

Male.—Length 2¼ lines. Black: head wider than the thorax; legs pale ferruginous: abdomen with pubescent fasciæ. Head: the mandibles and flagellum of the antennæ pale ferruginous, the former rufo-piceous at their apex; the front covered with short, pale-fulvous pubescence. Thorax: a little fulvous pubescence on the scutellum, that on the sides of the metathorax, beneath, and on the legs, is cinereous; wings hyaline and splendidly iridescent, the tegulæ and nervures rufo-testaceous. Abdomen: narrowed towards its base, closely and finely punctured; the margins of the segments depressed; the apical margins of all the segments with fasciæ of pale fulvous pubescence.

Hab.—Northern India.

In this small species the posterior femora are not swollen, and the tibiæ are not wider than the first joint of the tarsi.

*2. *Nomia clypeata.* (Pl. II. fig. 18, ♂.)

Male.—Length 3½ lines. Black: the flagellum of the antennæ, the mandibles, apex of the clypeus, ferruginous; the abdomen with pale fulvous pubescent fasciæ. The face, below the insertion of the antennæ, covered with dense silvery-white pubescence. Thorax: the mesothorax closely and finely punctured, and with short, pale-fulvous pubescence, that on the post-scutellum being white; on the sides, and also beneath it, is cinereous; the legs rufo-piceous, with short glittering cinereous pubescence above; the posterior femora swollen, not greatly so, the tibiæ dilated to their apex; wings hyaline and iridescent, the

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nervures rufo-testaceous; the tegulæ testaceous, palest at their outer margins. Abdomen: very closely and finely punctured; a pale-fulvous fascia on the apical margins of all the segments.

Hab.—India.

In the unique example of this species the fascia of the basal segment only remains at the sides; it is most probably abraded in the middle.

*3. *Nomia basalis.*

Female.—Length 4 lines. Black, with the flagellum of the antennæ and the legs ferruginous. Head: the front with silvery-white pubescence; the scape of the antennæ rufo-piceous, the mandibles ferruginous at their apex; the clypeus coarsely punctured. Thorax: the mesothorax with large, somewhat distant punctures; the sides of the prothorax, a line at the apical margin of the mesothorax, the post-scutellum, and sides of the metathorax, with short white tomentose pubescence; the legs have a glittering silvery-white pubescence; wings hyaline, faintly clouded at their apical margins, the nervures rufo-testaceous; the tegulæ large, pale testaceous, and more or less rufo-fuscous at their inner margins anteriorly. Abdomen short and ovate; the basal segment closely and deeply punctured; the basal margins of the second and third segments with fascia of white pubescence; a narrow, pale-yellowish fascia, not pubescent, on the third segment near its apical margin; rufo-testaceous beneath.

Hab.—India.

*4. *Nomia fervida.* (Pl. II. fig. 12, ♂.)

Male.—Length 4 lines. Black: the legs pale yellow, with rufo-fuscous markings; abdomen with fine pale yellowish-white fasciæ. Head: the face covered with bright pale-golden pubescence; the antennæ pale fulvous beneath. Thorax: the mesothorax very finely and closely punctured, its margins, as well as the post-scutellum, with yellowish-white tomentum; the coxæ, trochanters and base of the intermediate and posterior femora rufo-fuscous, a spot of the same colour on the outside of the posterior tibiæ; the posterior femora greatly swollen, and with a tooth on the inferior margin near their apex; the tibiæ greatly dilated at their apex. The apical margins of the

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segments of the abdomen pale testaceous, and covered with yellowish-white tomentum. Wings hyaline, faintly clouded at their apex, the nervures rufo-testaceous, with their tegulæ pale.

Hab.—India (the Deccan).

5. *Nomia combusta.* (Pl. II. fig. 9, ♂.)

Male.—Length 4½ lines. Black: the face with golden pubescence; the legs and antennæ pale ferruginous; the tarsi yellowish. The anterior margin of the thorax and the post-scutellum with yellowish-white tomentum; that on the scutellum, lateral and posterior margin of the mesothorax is fulvous; wings fulvo-hyaline, the nervures rufo-testaceous; their apical margins faintly clouded; the posterior femora much swollen, and with a minute tooth beneath; the tibiæ much dilated at their apex, and produced into an acute process. Abdomen narrowed to its base; the apical margins of the segments with pale-fulvous, rather broad pubescent fasciæ.

Hab.—Bombay.

This species is remarkable in having its anterior tarsi fringed behind with bright pale-fulvous pubescence.

6. *Nomia pilipes.*

Female.—Length 3¾ lines. Head and thorax black; abdomen ferruginous. Head, thorax and legs densely clothed with short cinereous pubescence, that on the thorax above is ochraceous; the flagellum of the antennæ beneath, and the apical joints of the tarsi, ferruginous; the mandibles ferruginous at their apex. The wings hyaline and iridescent; the nervures testaceous; the costal nerve and the stigma fuscous. The apical margins of the segments of the abdomen with white pubescent fasciæ, that on the basal segment being the narrowest.

Hab.—Northern India.

*7. *Nomia terminata.*

Female.—Length 5½ lines. Black: wings fulvo-hyaline, with a dark-fuscous cloud at the apex of the anterior pair extending from the apex of the marginal cell. Head and thorax very closely punctured, the clypeus more coarsely so; the flagellum, except the three basal joints, fulvous beneath. The entire pubescence fulvous; the tegulæ of

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the wings rufo-testaceous; the abdomen smooth, shining, and very delicately punctured; slightly pubescent at the base.

Hab.—Birmah.

This species would in all probability have a thin pubescence both on the thorax and abdomen if in the finest condition. The unique example was collected in spirit.

8. *Nomia carinata.*

Female.—Length 3½ lines. Black: the head and thorax closely punctured, the head most finely so; the clypeus with a central longitudinal carina; its lateral margins being also slightly raised. The flagellum fulvous beneath; the pubescence on the face and cheeks cinereous. Thorax: the post-scutellum with pale tomentum; the pubescence on the sides, beneath, and on the legs, cinereous; the femora, tibiæ and tarsi ferruginous; the anterior and intermediate tibiæ and tarsi, and also the posterior tarsi, rufo-piceous above; the wings hyaline, the nervures dark fusco-ferruginous, the outer margin of the tegulæ pale testaceous. Abdomen: the apical margin of all the segments white, with tints of green in certain lights; beneath, the margins of the segments fringed with pale-fulvous pubescence.

Hab.—Ceylon.

*9. *Nomia albofasciata.*

Female.—Length 4¼ lines. Black: the abdomen with a white fascia on the apical margin of the first and three following segments. Head: the front and cheeks with cinereous pubescence; the thorax densely clothed above with short, ochraceous pubescence, that on the legs is of a silvery whiteness, except that on the tarsi beneath, which is bright fulvous; the flagellum, except the first joint, fulvous beneath; wings hyaline, the nervures fuscous, the tegulæ pale rufo-testaceous. Abdomen very finely and closely punctured at the base; the two apical segments with short rufo-fulvous pubescence.

Hab.—Java.

*10. *Nomia fuscipennis.*

Female.—Length 5 lines. Black: head closely and finely punctured, opaque; abdomen shining, the base with a few distant fine punctures, the other portion finely and

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closely punctured; the face with a thin griseous pubescence; the clypeus coarsely punctured; the flagellum of the antennæ fulvous beneath. Thorax: the post-scutellum and sides of the metathorax with white pubescence; the general pubescence on the legs griseous, a dense floccus on the posterior femora beneath; the apical joints of the tarsi ferruginous, their pubescence beneath fulvous; wings fusco-hyaline, a darker cloud along their anterior margin, and occupying the apex of the anterior wing beyond the third submarginal cell. Abdomen: a thin griseous pubescence at the extreme base, and on the sides and beneath.

Hab.—Sumatra.

From Sir Stamford Raffles' Collection.

*11. *Nomia quadridentata.* (Pl. II. fig. 6, ♂.)

Female. Length 5 lines. Black: the pubescence pale fulvous, the abdomen with four blue-green or greenish-yellow fasciæ. Head and thorax finely shagreened; the clypeus rugose and with a longitudinal carina; the posterior margin of the mesothorax and the post-scutellum with dense, short, pale pubescence; on the sides of the metathorax it is long and dense; the posterior femora thickly fringed beneath, and the entire pubescence of the legs pale fulvous, very bright and glittering; the wings subhyaline, the nervures fusco-ferruginous, the stigma and costal nervure darkest; the apical margins of the wings faintly clouded; the tegulæ pale testaceous. Abdomen very finely and closely punctured, the base with a thin fulvous pubescence.

Male.—The same length as the female; the pubescence on the face cinereous; the scutellum, mesothorax and base of the abdomen more strongly punctured than in the female; the scutellum with a minute spine at its posterior lateral angles, the post-scutellum having two longer ones; the posterior femora greatly swollen and with a cinereous fringe beneath; the tibiæ more or less obscurely ferruginous, curved, and terminating in a pale-ferruginous process beneath, which is rounded at its apex. Abdomen with four fasciæ varying in colour, as in the female.

Hab.—Celebes; Java; Morty Island.

*12. *Nomia floralis.*

Female.—Length 3½ lines. Black: the base of the abdomen ferruginous. Head: the front and cheeks with

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griseous pubescence. Thorax finely and closely punctured above; the margins of the mesothorax and the postscutellum with short, pale, fulvous pubescence, that on the legs is still paler, and very bright and glittering; the legs rufo-piceous, the tarsi paler; wings subhyaline, their apical margins clouded, the nervures and tegulæ rufo-testaceous, the stigma pale. Abdomen: the basal segment and apical half of the second ferruginous; the apical margin of the second and following segments with fasciæ of pale-fulvous pubescence.

Hab.—Hong Kong.

*13. *Nomia opposita.*

Female.—Length 4½ lines. Black; the head, mesothorax and scutellum very finely and closely punctured; the metathorax coarsely rugose. Head: the front thinly covered with cinereous pubescence, the clypeus fringed with fulvous hairs at its anterior margin. Thorax: its pubescence cinereous, on the tibiæ and tarsi exteriorly it is fuscous; wings hyaline and iridescent, faintly clouded at their apical margins, the nervures dark fuscous. Abdomen slightly shining, very finely and closely punctured; a pale-pubescent, narrow fascia at the basal margins of the second, third and fourth segments.

Hab.—North China.

*14. *Nomia chalybeata.* (Pl. II. fig. 5, ♂).

Female.—Length 5½ lines. Head and thorax black; the abdomen obscurely chalybeous in the female, and brightly so in the male. Head: the front with a thin cinereous pubescence, on the cheeks it is more dense; the clypeus rough, with confluent punctures, and having a longitudinal carina; the flagellum of the antennæ, except the first joint, fulvous beneath. Thorax closely punctured above, and with more or less of fulvous pubescence; the legs have a pale-fulvous, glittering pubescence; the apex of the claw-joints ferruginous; wings subhyaline, faintly clouded at the apex of the superior pair, the nervures ferruginous. Abdomen closely punctured, most strongly so at the base; the second and two following segments have a narrow green or blue-green fascia on their apical margins; the three terminal segments with short black pubescence, which is most dense on the apical one.

Male.— The same size as the female, the abdomen being

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rather more strongly and closely punctured towards the base; it has also an additional band on the abdomen, the fasciæ being in some examples greenish-yellow; the posterior femora incrassate, the tibiæ curved and produced at their apex within into a thin, pale-testaceous process, which is truncate at the apex.

Hab.—Shanghai, N. China.

*15. *Nomia Australica.* (Pl. II. fig. 11, ♂.)

Female.—Length 4½—5 lines. Head and thorax black, abdomen steel-blue. Head: the scape of the antennæ, the flagellum beneath and the anterior margin of the clypeus ferruginous, the scape sometimes fuscous behind; the front and vertex with pale-fulvous pubescence, that on the cheeks cinereous. Thorax: very delicately punctured above, and with distant stronger punctures interspersed; the pubescence on the sides, beneath, and on the legs, cinereous; the post-scutellum with short white pubescence; wings subhyaline, faintly clouded at their apical margins; the exterior margins of the tegulæ more or less testaceous. Abdomen: very finely and very closely punctured; the third and fourth segments with pubescent fasciæ, more or less fulvous on their apical margins; sometimes a more or less interrupted fascia on the second segment, but usually obsolete.

Male.—Bears a strong resemblance to the female, but narrower, the abdomen being narrowed towards its base; the antennæ as long as the head and thorax; the apex of the clypeus, and also the mandibles pale testaceous. The posterior femora swollen, the tibiæ dilated at their apex, and produced beneath into a truncate process.

This appears to be the most abundant species found in Australia. It not only varies in the colour of its pubescence from age, but also apparently from the locality it inhabits, specimens from Adelaide being the most highly coloured that I have seen.

Hab.—Adelaide; Port Philip; Moreton Bay; Swan River; Champion Bay.

*16. *Nomia mœrens.*

Female.—Length 4⅛ lines. Black: very closely and finely punctured, except the clypeus, which is coarsely punctured; the pubescence cinereous, except that on the tarsi beneath, which is bright fulvous. The antennæ

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slightly fulvous towards their apex beneath. Thorax: the wings sub-hyaline, slightly clouded at their apical margins; the pubescence on the posterior legs very bright and glittering. The apical margins of the second, third and fourth segments of the abdomen with narrow, white-pubescent fasciæ, frequently more or less interrupted; at the extreme apex it is fusco-ferruginous.

Hab.—Australia.

Nomia generosa is probably the male of this species.

*17. *Nomia generosa.*

Male.—Length 4¼ lines. Black: closely and finely punctured; the tibiæ and tarsi bright ferruginous. Head: the front and cheeks with cinereous pubescence; antennæ as long as the head and thorax. Thorax: the pubescence on the thorax and legs cinereous; wings hyaline at their base, their apical half slightly fuscous, the nervures and tegulæ ferruginous; the scutellum bituberculate: the post-scutellum with white pubescence; the posterior femora and tibiæ not enlarged. Abdomen: the apical margins of the second and following segments with narrow, white-pubescent fasciæ; beneath rufo-piceous.

Hab.—Moreton Bay.

*18. *Nomia gracilipes.*

Female.—Length 3¾ lines. Head and thorax black; abdomen blue, with the apex ferruginous. Head: the front and the cheeks with griseous pubescence; the flagellum of the antennæ bright fulvous beneath. Thorax: the sides, beneath, and the legs, with griseous pubescence; the meso-thorax with two ovate spots of white pubescence posteriorly at the margin of the scutellum; the post-scutellum with white pubescence; wings hyaline, with their apical margins slightly fuscous. Abdomen: a little white pubescence on the apical margins of the first, second and third segments laterally.

Male.—As long as the female, and similarly coloured; the apex of the clypeus pale testaceous; antennæ as long as the head and thorax; the flagellum bright fulvous beneath; the thorax as in the female; in fine examples, the white spots of pubescence frequently obliterated: the posterior legs simple, or very slightly swollen. Abdomen oblong, with white spots, as in the female.

Hab.—Adelaide.

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A number of specimens have been examined, not one being in very fine condition. It is probable that the thorax would have been more pubescent, and the margins of the segments have had more complete fasciæ, had specimens in fine condition been available.

19. *Nomia nana.*

Female.—Length 3½ lines. Black: the coxæ, trochanters and femora rufo-piceous; the tibiæ and tarsi ferruginous; abdomen with broad, yellowish-white pubescent fasciæ on the second and following segments, the first having a little pubescence laterally; at the extreme apex of the abdomen a little fulvous pubescence. The face with a thin griseous pubescence; the flagellum fulvous beneath, except one or two of the first joints. Thorax: the wings subhyaline, their apical margins slightly clouded; the nervures and tegulæ pale ferruginous; the post-scutellum with pale pubescence.

Hab.—Adelaide.

*20. *Nomia ruficornis.* (Pl. II. fig. 7, ♂.)

Male.—Length 3½ lines. Black: the flagellum of the antennæ ferruginous, and also the apex of the femora, the tibiæ and tarsi; the abdomen with cinereous fasciæ on the apical margins of the second and following segments. Head: the face with cinereous pubescence; the apex of the clypeus rufo-testaceous; the wings hyaline, faintly clouded at their apical margins; the nervures ferruginous; the tegulæ rufo-testaceous; the posterior femora swollen; the tibiæ broadly dilated. Abdomen oblong-ovate.

Hab.—Sydney.

*21. *Nomia dentiventris.* (Pl. II. fig. 15, ♂.)

Male.—Length 4 lines. Black: the abdomen with pale-fulvous pubescent fasciæ; the posterior femora dilated, and the third ventral segment with two blunt teeth. Head: the front with pale fulvous pubescence; that on the cheeks cinereous, and that on the vertex fuscous. Thorax: thinly covered with short fuscous pubescence above; on the sides, beneath and on the legs it is cinereous; wings hyaline and iridescent, faintly clouded at their apical margins; the nervures fusco-ferruginous; the tegulæ dark rufo-testaceous; legs rufo-piceous, with the tibiæ, tarsi

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and apex of the femora ferruginous; the posterior femora swollen; the tibiæ dilated and abruptly narrowed at their base. Abdomen oblong.

Hab.—Sydney.

22. *Nomia ærata.*

Male.—Length 3¼ lines. Of a brassy colour; the head and thorax obscurely so. Head: the flagellum of the antennæ, the anterior margin of the clypeus and the mandibles, except their extreme base, rufo-fulvous; the face with glittering cinereous pubescence. Thorax: a little cinereous pubescence on the sides of the metathorax; a thin similar pubescence beneath, on the sides and on the legs; the legs ferruginous; the femora rufo-piceous above; the posterior femora slightly swollen; the tibiæ dilated at their apex; wings hyaline; their nervures and tegulæ rufo-testaceous. Abdomen bright and brassy, with the apical margins of the segments depressed; beneath rufo-piceous, with an æneous tinge.

Hab.—Australia.

*23. *Nomia ænea.* (Pl. II. fig. 13, ♂.)

Male.—Length 4 lines. Obscurely æneous; the coxæ and femora rufo-piceous; the tibiæ and tarsi ferruginous. Head as wide as the thorax; the flagellum, except the first joint, fulvous beneath; the apical margin of the clypeus and the mandibles ferruginous; the front with cinereous pubescence. Thorax closely punctured; the wings hyaline; nervures fusco-ferruginous; the posterior femora and tibiæ swollen; the apical margins of the second and following segments with pale-fulvous pubescence.

Hab.—Port Essington.

*24. *Nomia Nilotica.*

Female.—Length 4 lines. The mandibles, antennæ, legs, thorax beneath, and base of the abdomen ferruginous; otherwise black. Head: the front densely covered with short snow-white pubescence; the anterior margin of the thorax with white tomentum; the legs have, outside, a glittering white pubescence; the wings hyaline, the nervures ferruginous; the tegulæ large and white, with a ferruginous spot at their inner anterior margin. Abdomen with broad, white-pubescent fasciæ.

Hab.—White Nile.

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The fasciæ are abraded in some degree in the unique specimen, but enough remains to show that all, except perhaps the first segment, had entire fasciæ when the insect was in perfect condition.

25. *Nomia rufipes.* (Pl. II. fig. 3, ♂.)

Male.—Length 3¾ lines. Black: the legs, flagellum and mandibles pale ferruginous; the pubescence pale fulvous, except that on the cheeks, which is cinereous. Thorax with short pubescence above; the wings fulvo-hyaline, the nervures and tegulæ pale ferruginous; the legs have the coxæ and trochanters black; the posterior femora swollen and with a stout tooth beneath; the tibiæ curved, dilated at their apex, and with a small acute tooth in the middle of their inner margin. Abdomen very finely and closely punctured, pubescent, with the apical margins of all the segments testaceous, and with fasciæ of pale-fulvous pubescence.

Hab.—Gambia.

*26. *Nomia tridentata.* (Pl. II. fig. 10, ♂.)

Male.—Length 3⅛ lines. Black, pubescent; the posterior femora very greatly swollen and pubescent, with three sharp teeth or spines beneath, the third, near their apex, being the smallest. Head: the face with bright pale yellowish-white pubescence, that on the cheeks cinereous; the flagellum of the antennæ fulvous beneath. Thorax clothed above with dull fulvous pubescence, beneath and on the legs it is pale fulvous; the legs rufo-piceous; the tarsi pale; the posterior femora palest beneath; the tibiæ curved, and produced at their apex beneath into a long, pale-testaceous process, somewhat lanceolate in form; wings hyaline and iridescent, the nervures rufo-testaceous. Abdomen ovate and pubescent, that at the base cinereous, the rest fulvous; the apical margins of the segments, except the basal one, testaceous; beneath, the segments towards the apex with long, dense cinereous pubescence.

Hab.—Cape of Good Hope; Gambia.

This species is somewhat like *Nomia vulpina*, Gerst., described and figured in Reis. Mossamb. (Peters), but it is a smaller insect, its pubescence of a different colour, and its abdomen and posterior legs of a different form.

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27. *Nomia rubella.* (Pl. II. fig. 17, ♂.)

Male.—Length 5 lines. Head and thorax black; abdomen red. Head and thorax closely and strongly punctured; the front of the head clothed with griseous pubescence. The mesothorax with a central impressed line and an abbreviated one on each side of it; the scutellum depressed in the middle and subtuberculate on each side; wings fuscous and with a violet iridescence; the posterior femora and tibiæ punctured, the former greatly swollen, and with a minute tooth beneath near their apex; the tibiæ narrow at their base to one-third of their length, then abruptly dilated, and having a minute tooth beneath near their apex; the tarsi ferruginous at their base. Abdomen black at its extreme base, rather strongly and very closely punctured; the apical margins of the segments smooth and shining; the apex with fuscous pubescence.

Hab.—Gambia.

28. *Nomia lamellata.* (Pl. II. fig. 8, ♂.)

Female.—Length 5½ lines. Black: the legs ferruginous; abdomen with four white, or pale-yellow fasciæ. Head: the antennæ and mandibles ferruginous; the front with pale bright pubescence, that on the cheeks white. Thorax: the pubescence at the margins of the mesothorax pale fulvous, on the sides and beneath it is nearly white; wings subhyaline, the nervures and tegulæ ferruginous; on each side of the scutellum is a thin, short, projecting, pale-testaceous lamella, and another, the width of the post-scutellum, projects from its base, and is deeply notched in its posterior margin. Abdomen: the apical margins of the first and three following segments with pale-yellow fasciæ, sometimes cream-coloured, the first being the narrowest.

Male.—Greatly resembles the female, but has an additional fascia on the abdomen, and has the posterior femora much swollen; the tibiæ swollen and greatly dilated, and produced at their apex beneath into a long pointed process; at their base above is a little snow-white pubescence.

Hab.—Gambia; Egypt.

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*29. *Nomia cinerascens.*

Male.—Length 2¾ lines. Black, and thinly covered with cinereous pubescence, that on the face being pale golden. The flagellum of the antennæ fulvous, except the basal joint, and slightly fuscous above. Thorax: the post-scutellum with short, white pubescence; the wings hyaline and brightly iridescent; the nervures pale testaceous; the anterior tibiæ in front and all the tarsi pale rufo-testaceous; the posterior femora not dilated. Abdomen gradually widened to the apex, which is pale testaceous, the margins of the segments depressed, somewhat testaceous, and with pale pubescent fasciæ.

Hab.—Natal.

*30. *Nomia producta.* (Pl. II. fig. 16, ♂.)

Male.—Length 5½ lines. Black: the pubescence cinereous; the clypeus greatly produced forwards, to nearly half the length of the head, its apex, as well as the labrum, white. Thorax: the wings hyaline, with a darkish-fuscous cloud beyond the enclosed cells, which extends to their apical margins; the legs obscure fusco-ferruginous; the posterior femora slightly dilated; the tibiæ curved, widened at their apex, which is produced into an elongate, pale-testaceous, scale-like process. Abdomen elongate and widened towards its apex, covered with a slightly fulvous pile, the apical margins of the segments with bright silvery-white fasciæ, observable in certain lights, the margins being narrowly testaceous.

Hab.—Natal.

*31. *Nomia serratula.*

Male.—Length 3¾ lines. Black: the apical margins of the segments of the abdomen bright rufo-testaceous; the entire insect closely and strongly punctured. Head, below the insertion of the antennæ, covered with cinereous pubescence. Thorax: the legs obscurely rufo-piceous, the tarsi palest; a cinereous pubescence on the legs as well as on the thorax beneath and on the sides; the posterior legs not swollen, their tibiæ serrated exteriorly; wings subhyaline at their base, with a fuscous cloud beyond the stigma, and brightly iridescent; the nervures

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fuscous, the tegulæ black. Abdomen: the apical margins much depressed; beneath rufo-testaceous.

Hab.—Natal.

This species varies in the colouring of the abdomen from that described to being ferruginous with only the basal segment, or with that and a dark stain in the middle of the second, black.

*32. *Nomia rufitarsis.*

Male.—Length 3 lines. Black, closely punctured, tarsi pale ferruginous, abdomen with three snow-white fasciæ. Head: the face covered with cinereous pubescence; the flagellum of the antennæ fulvous beneath. Thorax: the pubescence on the sides, beneath and on the legs cinereous; the scutellum bituberculate, the post-scutellum with white pubescence, wings hyaline and iridescent, nervures fuscous; the tegulæ testaceous, posterior legs simple. Abdomen: the apical margins of the second, third and fourth segments white; the margin of the basal segment fringed laterally with griseous pubescence.

Hab.—Angola Country (Africa).

*33. *Nomia armata.* (Pl. II. fig. 14, ♂.)

Male.—Length 5 lines. Black: the pubescence fulvous, more or less bright; the posterior femora and tibiæ enlarged, and armed with a short tooth. Head covered below the insertion of the antennæ with bright pale-fulvous pubescence; the flagellum of the antennæ fulvous beneath; the mandibles pale ferruginous. Thorax densely clothed above with short fulvous pubescence; wings subhyaline, slightly clouded at their apex, the nervures ferruginous; the anterior and intermediate tarsi, tibiæ and femora, except the base of the latter, and the posterior femora (at their apex), tibiæ and tarsi, fulvo-ferruginous; the posterior femora greatly swollen, and with an acute tooth in the middle of their inferior margin; the tibiæ curved, dilated towards their apex, with an acute tooth beneath, and produced at their apex into a pointed process. Abdomen closely and finely punctured, the apical margins of the segments testaceous and with fasciæ of pale-fulvous pubescence.

Hab.—Sierra Leone.

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*34. *Nomia fulvohirta.*

Female.—Length 4½ lines. Black: the pubescence fulvous, that on the face being paler than the rest; on the metathorax it is also pale; on the mesothorax it is short and dense; the apical margins of the second and following segments of the abdomen with pubescent fasciæ. The flagellum bright fulvous beneath; the mandibles ferruginous at their base; the wings hyaline, their nervures rufo-testaceous, as well as the tegulæ, the costal nervure fuscous. The base of the abdomen very finely and closely punctured.

Male.—Rather smaller than the female, which it greatly resembles; the face with bright fulvous pubescence; the antennæ ferruginous, with the flagellum more or less fuscous above. Wings as in the female; the legs bright pale ferruginous, the coxæ and trochanters rufo-piceous; the posterior femora not swollen. The two basal segments of the abdomen finely and closely punctured.

Hab.—Sierra Leone.

*35. *Nomia candida.*

Female.—Length 3¼ lines. Black: the abdomen with three yellowish-white fasciæ. Head: the front with short cinereous pubescence. Thorax densely clothed above with very short fulvous pubescence, that on the post-scutellum nearly white; the legs rufo-piceous; the apical joints of the tarsi palest; the tibiæ and tarsi with glittering cinereous pubescence. Abdomen: the apical margin of the first segment with a narrow, lateral, whitish-pubescent fascia, the apical margins of the following segments white, faintly tinged with yellow, not pubescent.

Hab.—Sierra Leone.

*36. *Nomia nubecula.*

Male.—Length 4 lines. Black: the pubescence fulvous, the tibiæ and tarsi pale ferruginous; the anterior wings hyaline, with a dark cloud at their apex, commencing at the apex of the third submarginal cell. Head anteriorly clothed with short, bright, pale-fulvous pubescence; the mandibles ferruginous; the scape, and the flagellum, fulvous beneath. Thorax above closely punctured; the scutellum bituberculate; the tegulæ not enlarged, and rufo-testaceous; the posterior femora and

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tibiæ simple. Abdomen shining, slightly punctured at the base, more closely and strongly so beyond; the apical margins of the segments narrowly testaceous, and fringed with pale-fulvous pubescence.

Hab.—Sierra Leone.

This species would probably have the mesothorax and scutellum covered with short, fulvous pubescence, in very recently disclosed specimens.

*37. *Nomia tegulata.*

Female.—Length 2½—3¼ lines. Black, and thinly covered with short cinereous pubescence, that on the tarsi and posterior tibiæ pale fulvous. Head: the flagellum fulvous beneath towards the apex; the clypeus rather strongly and closely punctured. Thorax: the metathorax smooth, with the sides punctured; wings hyaline, with their apical margins clouded, the nervures testaceous, the tegulæ large and pale testaceous, having anteriorly a rufo-fuscous spot; the posterior tibiæ and all the tarsi pale ferruginous. Abdomen: at the basal margins of the segments a fascia of pale pubescence, over which is a thin fringe of pale-fulvous hairs on the apical margins.

Hab.—Sierra Leone.

*38. *Nomia Kirbii.* (Pl. II. fig. 19, 20, ♂.)

Male.—Length 6½ lines. Black: the pubescence sooty-black, the antennæ elongate, reaching to the posterior margin of the scutellum, the apical joint club-shaped and compressed; the wings dark fuscous, the apical margins of the segments of the abdomen obscurely testaceous.

Hab.—Brazil, or Mexico.

This insect, which is, I believe, unique in the British Museum, is in a very bad state of preservation, so much so as to render it quite possible that its original colouring was very different to that it at present exhibits; the abdomen had probably fulvous fasciæ, and the face and sides of the metathorax might also have had fulvous pubescence. An examination of a perfect specimen would, I believe, prove that it belongs to a new genus. It was formerly in the collection of the Rev. Wm. Kirby, who attached a memorandum to it: "Gen. nov. inter Andrena et Panurgus."

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DESCRIPTION OF PLATE II.

1. Posterior leg of *Nomia diversipes*, ♂.
2. „ „ *difformis*, ♂.
3. „ „ *rufipes*, ♂.
4. „ „ *similima*, ♂.
5. „ „ *chalybeata*, ♂.
6. „ „ *quadridentata*, ♂.
7. „ „ *ruficornis*, ♂.
8. „ „ *lamellata*, ♂, and the scutellum.
9. „ „ *combusta*, ♂.
10. „ „ *tridentata*, ♂.
11. „ „ *australis*, ♂.
12. „ „ *fervida*, ♂.
13. „ „ *ænea*, ♂.
14. „ „ *armata*, ♂.
15. „ „ *dentiventris*, ♂.
16. „ „ *producta*, ♂.
17. „ „ *rubella*, ♂.
18. „ „ *clypeata*, ♂.
19. Antenna of „ *Kirbii*, ♂.
20. Posterior leg of „ „ ♂.

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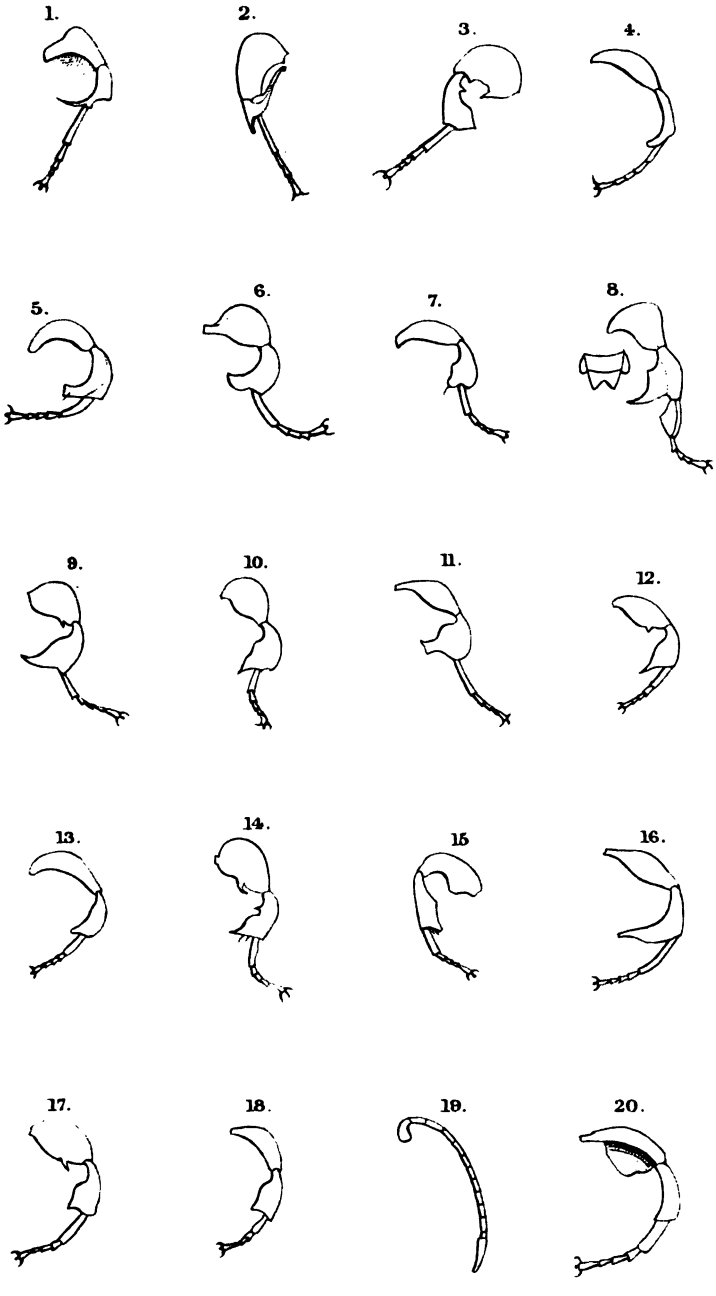

E. Smith lith. Mintern Bro

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VI. *On the Lamellicorn* Coleoptera *of Japan.* By Chas. O. Waterhouse.

[Read March 15th, 1875.]

The present paper is intended to give a complete account of the Lamellicorn *Coleoptera*, known at the present time to be inhabitants of Japan.

A considerable collection was brought to this country by Mr. George Lewis, containing, as will be seen from the list, very numerous species new to science, all collected in South Japan. I have added to this list a few new species from the northern island, and such others as have already been noticed as inhabitants of Japan.

SCARABÆIDÆ.

Temnoplectron parvulum, C. W.
Caccobius jessoënsis, Harold.
„ brevis, C. W.
Catharsius ochus, Motsch.
Copris tripartita, C. W.
„ acutidens, Motsch.
Onthophagus Lenzii, Harold.
„ fodiens, C. W.
„ ater, C. W.
„ japonicus, Harold.
„ atripennis, C. W.
„ vidnus, Harold.
„ nitidus, C. W.
„ ocellatopunctatus, C. W.
Oniticellus phanæoides, Westw.

APHODIIDÆ.

Aphodius apicalis, Harold.
„ major, C. W.
„ globulus, Harold.
„ elegans, Allibert.
„ lividipennis, C. W.
„ diversus, C. W.
„ rectus, Motsch.
„ breviusculus, Motsch.
„ castaneipennis, C. W.
„ nigerrimus, C. W.
„ 4-punctatus, Udd.
„ uniplagiatus, C. W.
„ uniformis, C. W.
Aphodius impunctatus, C. W.
„ pallidicinctus, C. W.
„ vitta, Motsch.
„ obsoleteguttatus, C. W.
„ pallidiligonis, C. W.
„ punctatus, C. W.
„ obsoletus, C. W.
„ ovalis, C. W.
„ rufangulus, C. W.
„ urostigma, Harold.
„ variabilis, C. W.
„ nigrotessellatus, Motsch.
„ atratus, C. W.
„ rugosostriatus, C. W.
„ Lewisii, C. W.
Ammœcius nitidulus, C. W.
Saprosites japonicus, C. W.
Rhyssemus asperulus, C. W.
Psammodius convexus, C. W.
Ægialia nitida, C. W.

GEOTRUPIDÆ.

Ochodæus maculatus, C. W.
Bolboceras nigroplagiatum, C. W.
Geotrupes lævistriatus, Motsch.
„ auratus, Motsch.
„ purpurascens, C. W.

TROGIDÆ.

Trox setifer, C. W.
„ obscurus, C. W.
„ opacotuberculatus, Motsch.

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MELOLONTHIDÆ.

Ectinohoplia variolosa, C. W.
Hoplia communis, C. W.
„ mœrens, C. W.
Serica boops, C. W.
„ brunnea, Linn.
„ grisea, Motsch.
„ polita, Gebler.
„ japonica, Motsch.
„ orientalis, Motsch.
Apogonia splendida, Bohem.
„ major, C. W.
Holotrichia parallela, Motsch.
„ picea, C. W.
„ morosa, C. W.
„ castanea, C. W.
„ transversa, Motsch
Pollaplonyx (g. n.) flavidus, C. W.
Heptophylla picea, Motsch.
Granida albolineata, Motsch.
Hoplosternus japonicus, Harold.
Melolontha japonica, Burm.

RUTELIDÆ.

Phyllopertha horticola, Linn.
„ diversa, C. W.
„ irregularis, C. W.
„ orientalis, C. W.
„ arenaria, Brullé.
„ octocostata, Burm.
Anomala { rufocuprea, Motsch. / *var.* lucidulus, Motsch.
„ geniculata, Motsch.
„ costata, Hope.
Anomala testaceipes, Motsch.
„ flavilabris, C. W.
„ difficilis, C. W.
„ pubicollis, C. W.
Euchlora cuprea, Hope.
„ albopilosa, Hope.
„ multistriata, Motsch.
Mimela Gaschkevitchii, Motsch.
„ lucidula, Hope.
„ [testaceoviridis, Blanch.]
Popilia japonica, Newm.
Adoretus tenuimaculatus, C. W.

DYNASTIDÆ.

Xylotrupes dichotomus, Linn.
Phileurus chinensis, Falderm.

CETONIIDÆ.

Rhomborrhina japonica, Hope.
„ unicolor, Motsch.
„ polita, C. W.
Glycyphana pilifera, Motsch.
„ { argyrosticta, Burm. / albosetosa, Motsch.
„ Sieboldi, Sn. v. Voll.
„ fulvistemma, Motsch.
Cetonia submarmorea, Burm.
„ speculifera, Swartz.
Anthracophora rusticola, Burm.
Gnorimus subopacus, Motsch.
Trichius fasciatus, Linn.
„ 17-guttatus, Sn. v. Voll.
Valgus angusticollis, C. W.

SCARABÆIDÆ.

Temnoplectron parvulum, C. Waterh.

Ent. Mo. Mag. 1874, x. p. 175.

Elongatum, subovatum, piceum, nitidum. Capite magno, leviter convexo, subrotundato, subtilissime et crebre punctulato; margine antico depresso, in medio bidenticulato atque inter denticulos emarginato. Thorace crebre distincte punctato, longitudine duplo latiori, sat convexo, antice angustato, margine antico leviter emarginato, postico rotundato, lateribus ad angulos anticos subito oblique angustatis; angulis anticis rectis, posticis obtusis. Elytris sat convexis, lævibus, longitudine non brevioribus; infra humeros latioribus, dein ad apicem arcuatim angustatis; singulis tenuissime septem-striatis.

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Tibiis compressis, arcuatis; tarsis compressis. Antennarum clava nigro-fusca.

Long. 2½ mill.; lat. 1½ mill.

Hab.—Fukuhora; Nagasaki, in cow-dung, March and April.

Caccobius jessoënsis, Harold.

Coleopterolog. Hefte, ii. 1867, p. 100.

"Ovalis, deplanatus, leviter nitidus, nigro-æneus, thorace subvirescente. Caput obsolete bicarinatum, clypeo integro. Thorax parum dense punctatus, punctis versus basin majoribus, angulis anticis acutiusculis. Elytra regione scutellari impressa, sat fortiter crenato-striata, interstitiis leviter convexis, punctulatis. Pygidium æqualiter sat dense punctatum. Palpi cum antennis picei. Prosternum ut in *C. Schreberi* carina longitudinali accessoria."

Long. 3⅓ lin.

Hab.—Hakodadi. Coll. Brit. Mus.

Caccobius brevis, sp. nov.

Niger, nitidus, punctatus, brevis; elytris obscure piceis. Capite transversim bicarinato, ante oculos vix dilatato, crebre punctato. Thorace leviter convexo brevissime pubescenti, antice quadrangulariter emarginato, angulis anticis vix obtusis, lateribus leviter rotundatis, postice leviter bisinuato, crebre fortiter punctato, postice ocellato-punctato. Elytris ad latera et ad apicem leviter rotundatis; leviter striatis, striis distanter obsolete punctulatis, interstitiis planis sat parce minute tuberculatis, et brevissime hirsutis. Antennis ferrugineis; clavâ nigrâ.

Long. 2—2½ lin.; lat. 1¼—1¾ lin.

Hab.—Hiogo; Osaka. In sandy places.

Catharsius ochus, Motsch.

Etud. Ent. 1860, p. 13.

"*Cath. jacchi* valde affinis, sed thoracis medio minus elevato, utrinque profundo-excavato; elongato-ovatus, convexus, niger; clypeo semilunato, creberrime punctato, fronte in cornu subcurvato producto; thorace punctatissimo, medio gibboso, subbilobo, elevato, utrinque rotundato-excavato; elytris thoracis latitudine, vix ovatis tenuissime

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striatis, interstitiis leviter convexis, subtilissime scarificato-rugulosis, subsericeo-nitidis."

Long. 9 lin.; lat. 4½ lin.

♀. Forehead with a short transverse carina; thorax with a ridge towards the front of the disk.

Hab.—Simabara and Hiogo, and other sandy districts in Kiushiu and Nipon. Very abundant.

Copris tripartita, sp. nov.

C. lunari affinis at minor, elytrorum interstitiis impunctatis. Niger, nitidus. Elytris punctato-striatis, interstitiis convexiusculis, impunctatis.

♂, max. Capite cornu longo erecto, fortiter punctato. Thorace utrinque cornu erecto longo apice acuto; dorso elevato, elevatione in medio a sulco fortiter punctato divisâ, antice quadrinodosâ; angulis anticis rectis extus emarginatis.

Long. 8½ lin.; lat. 4¾ lin.

♀. Capite cornu brevi obtuso. Thorace fortiter crebre punctato, dorso fere lævi a sulco fortiter punctato longitudinaliter diviso, antice carinâ transversâ brevi; angulis anticis rotundato-obtusis.

Long. 8 lin.; lat. 4½ lin.

♂, minor. Capite cornu brevi, acuto. Thoracis cornubus lateralibus nullis.

Long. 7 lin.

Closely allied to *C. lunaris*. The head is similar, but is only slightly emarginate in front. The thorax is of the same form but has the sides emarginate on the outside at the anterior angles, thus making them rectangular; the armature is the same, but the central raised part is more elevated and distinctly quadrituberculate on the front margin; the surface is strongly punctured everywhere except the upper part of the raised portion. The elytra are more distinctly punctate-striate, the interstices slightly more convex and without any punctuation.

In the female the thorax is thickly and strongly punctured, except a smooth spot on each side of the disk.

This species must not be confounded with an Indian one (for which I have no published name that I can depend upon), "*C. pompilius*, MSS.," which differs from *C. tripartita* in having in the larger development two small tubercles in front at the base of the raised portion; and the interstices of the elytra are distinctly although

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finely and moderately thickly punctured, whereas in *C. tripartita* they are without punctuation.

Hab.—Japan, Tsu-Sima.

Copris acutidens, Motsch.

Etud. Ent. 1860, p. 13.

"Figura *C. reflexi*, F., sed paulo major; oblonga, convexa, nitida, nigra, ♂ fronte in cornu longissimo, curvato-producto; thorace transverso, lateraliter explanato, medio cornis quatuor elevatis armato, lateralibus tenuis, acutissimis, mediis conjuncto-productis, apice obtusis, elytris elongato-subovatis, profunde punctato-striatis; ♀ clypeo antice valde inciso, fronte cornu brevi, erecto armato, thorace antice abrupte truncato, in carinam obtuso-elevato, prominulo, carina transversa."

Long. 5 lin.; lat. $2\frac{2}{3}$ lin.

Hab.—Hiogo, Osaka; usually abundant in sandy places where it occurs.

Onthophagus Lenzii, Harold.

O. Lenzii, Harold, Abhandl. Nat. Ver. Bremen, iv. 1874, p. 283.

Niger, subnitidus, antennis ferrugineis, vertice carinis duabus arcuatis approximatis, postica altiore, thorace utrinque ad latera excavato, dorso supra foveolam carinato, elytris leviter crenato-striatis, interstitiis parce, lateribus fortius punctatis.

Long. $5\frac{1}{2}$ lin.; lat. $3\frac{1}{4}$ lin.

Mas.—Carinâ anticâ verticis obsoletiore; tibiis anticis basi e latere compressis et inflexis.

Fem.—Tibiis anticis simplicibus, extus 4-dentatis.

Hab.—Nipon, Yesso. Abundant.

Allied to *O. angulatus*, Redt.

Onthophagus fodiens, sp. nov.

Niger, subnitidus, sat convexus, dense punctatus.

♂. Capite plano, latitudine $\frac{1}{4}$ longiori, antice rotundato, margine leviter reflexo, sat fortiter crebre punctato, transversim ruguloso. Thorace capite vix duplo latiori, lateribus rotundatis, antice emarginato, postice leviter bi-emarginato; angulis anticis prominentibus, obtusis; dorso fortiter gib-

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boso, antice utrinque declivo, supra angulos posticos carinato, fortiter crebre punctato, angulos anticos versus vix punctulato, angulis posticis fortiter et parce punctatis. Elytris dorsim subdepressis, brevibus, subopacis, leviter striatis, striis nitidis parce punctulatis; interstitiis subplanis sat parce tenuiter punctulatis, latera versus sat dense punctatis.

Long. 5 lin.; lat. 3 lin.

♀. Capite antice vix reflexo, fronte transversim bicarinatâ. Thorace leviter convexo, angulis anticis minus prominentibus.

Long. 3¾ lin.; lat. 2¾ lin.

Hab.—Onaura. Rare.

Onthophagus ater, sp. nov.

Ater, sat convexus, dense punctatus.

♂. Capite plano, antice fere truncato, margine reflexo, sat fortiter crebre punctato. Thorace capite vix duplo latiori, lateribus rotundatis; dorso gibboso, antice utrinque declivo, crebre fortiter punctato. Elytris vix nitidis, leviter striatis, interstitiis vix convexiusculis, crebre sat fortiter punctatis.

Long. 4 lin.; lat. 2¼ lin.

♀. Fronte obsolete bicarinatâ.

This species is very close to the preceding. It differs, however, in having the thorax rather more thickly punctured. The interstices of the elytra are less flat, and are thickly and somewhat strongly punctured, whereas in the preceding species the interstices are only moderately thickly punctured and the punctures are very lightly impressed. In *O. fodiens* the carinæ on the forehead of the ♀ are so placed that the anterior one is midway between the posterior one and the apex, whereas in *O. ater* the anterior carina is much nearer to the apex than to the posterior carina.

Hab.—Nipon and Kiushiu. Abundant everywhere.

Onthophagus japonicus, Harold.

O. japonicus, Harold, Abhandl. Nat. Ver. Bremen, iv. 1874, p. 290.

Niger, subæneus, nitidus. Elytris obscure flavis, maculis nonnullis humeralibus, fasciâ laceratâ pone medium, suturâ maculâque apicali nigris.

Long. 5 lin.; lat. 3 lin.

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♂. Capite antice rotundato, fronte carinâ semicirculari. Thorace gibboso, disco utrinque in dentem triangularem ampliato et ad latera sub dente foveâ magnâ nitidâ.

♀. Fronte bicarinatâ; thorace leviter convexo.

Varieties occur in which the black markings are reduced to a few spots.

Hab.—Hiogo and Osaka. "At the foot of Maiyasan it has occurred in great plenty."

Onthophagus atripennis, sp. nov.

Nigro-æneus; capite thoraceque nigro-cuprascentibus; elytris leviter striatis, striis tenuiter et parce punctulatis ad suturam vix punctulatis, latera versus distincte punctulatis, interstitiis planis. Antennis ferrugineis.

♂. Capite antice angulatim producto apice reflexo; inter antennas carinâ rectâ utrinque abbreviatâ, inter oculos laminâ transversâ apice semicirculariter emarginatâ. Thorace gibboso, disco excavato, excavationis marginibus postice utrinque in tuberculum instructis.

Long. 4¾ lin.; lat. 2¾ lin.

♂, *var. minor*. Capite antice rotundato, inter oculos carinâ abbreviatâ, inter antennas carinâ transversâ. Thorace leviter convexo, antice vix bituberculato.

Long. 4 lin.

Head as long as broad, contracted in front, the apex blunt and reflexed; there is a transverse slightly-raised ridge between the antennæ, and a perpendicular lamina between the eyes; this lamina is emarginate almost to its base; the clypeus is somewhat sparingly and finely punctured, the forehead rather more thickly and distinctly punctured. The thorax is evenly, moderately thickly, but not very strongly punctured. The elytra are as wide as the thorax and the same length, narrowed towards the apex, which is rounded; the scutellar region is somewhat flattened; the striæ are very delicate and very finely and sparingly crenate-striate; the interstices flat, that next the suture almost impunctate, the next sparingly and very delicately punctured, the rest becoming more distinctly punctured as they approach the sides.

Hab.—Kiushiu and Nipon; in woods and shady places under trees.

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Onthophagus viduus, Harold.

O. viduus, Harold, Abhandl. Nat. Ver. Bremen, iv. 1874, p. 283.

Convexus, sat nitidus, brevissime pubescens, nigro-æneus, antennis ferrugineis, elytris leviter crenato-striatis, interstitiis leviter convexis, irregulariter sat crebre punctatis.

♂. Clypeo ad apicem reflexo; fronte bicarinatâ; thorace gibboso, crebre sat fortiter punctato, disco antice fortiter impresso, impressionis lateribus postice utrinque in tuberculum instructis.

Long. 4 lin.

♂, *var. minor*. Thorace leviter convexo.

Long. 3 lin.

♀. Capite transversim bicarinato; thorace leviter convexo.

Long. 4 lin.

In the ♂ of this species the two carinæ on the forehead are situated one before and the other behind the eyes, the posterior one being often very obscure. In the ♀ the carinæ are both more distinct (abbreviated at each side), and are placed one between the eyes and the second (parallel to it) in front of it. In the male the clypeus is slightly acuminate in front, the apex slightly reflexed. The elytra present in some specimens a red spot at the shoulder and another near the apex of the third and fifth interstices.

Hab.—Kiushiu and Nipon. Generally distributed in open places, heaths, &c.

Onthophagus nitidus, sp. nov.

Nigerrimus, nitidus; thorace convexo, disco parce subtilius, lateribus distincte punctato; elytris striatis, striis remote indistincte punctatis; interstitiis sat convexis; sat parce fortiter punctatis.

Long. 3¼ lin.; lat. 2 lin.

Head flat, semicircularly rounded in front; the lateral angle of the head slightly obtuse; the anterior margin pitchy, very slightly reflexed; forehead not very thickly punctured, with a short, transverse, indistinct carina behind; the clypeus thickly and finely granulose-punctate. Thorax with a faint longitudinal impression behind, very convex and very shining, one-third broader than long,

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semicircularly emarginate in front to receive the head, the anterior angles obtuse, the sides rounded, the posterior margin obliquely bitruncate. The punctuation is sparse on the disk, and very lightly impressed; towards the sides and anterior angles it is thick and strong. The elytra rather shorter than broad, the sides gently rounded to the apex; the striæ are not very deeply impressed, indistinctly and remotely punctured; the interstices gently convex, somewhat sparingly but strongly punctured, the punctures forming irregular lines bordering the striæ. Pygidium moderately convex, coarsely and rather thickly punctured. Legs pitchy-black; the anterior tibiæ quadridentate on the outer edge; the antennæ pale ferruginous. The punctures both on the upper and under surfaces of the insect bearing short ferruginous hairs, especially on the under side.

Hab.—Hiogo and Nagasaki. In carrion and in bottles set with meat.

Onthophagus ocellato-punctatus, sp. nov.

Niger, subopacus, brevis. Capite parce fortiter punctato deplanato, ante oculos leviter rotundato-explanato, margine antico triangulariter emarginato, vertice tuberculo parvo armato. Thorace longitudine $\frac{1}{3}$ latiore, sat convexo, lateribus rotundatis, antice semicirculariter emarginato (angulis anticis prominulis, acutis, divaricatis), postice rotundato vix bisinuato; supra crebre fortiter occellato-punctato. Elytris thorace vix longioribus et non latioribus, lateribus leviter rotundatis, apicibus conjunctis rotundatis; striatis, striis fortiter crebre punctatis, interstitiis planis, parce subseriatim punctulatis, punctis brevissime setiferis.

Long. 4 mill.; lat. 2$\frac{1}{2}$ mill.

Hab.—Hiogo. Sea beach.

Oniticellus phanæoides, Westw.

Onthophagus phanæoides, Westw., Royle Himal. 1839. Ent. p. 55, t. 9, f. 3, ♂.

Onthophagus excavatus, Redt., Hügel. Kaschm. iv. 2, 1848, p. 523, ♂.

Phanæus minutus, Motsch., Etud. Ent. 1860, p. 13.

Niger, obscurus, clypeo cornu reflexo abrupte truncato, thorace phanæiformi, postice lateribus in spinam obtusam productis, femoribus luteis. Antennæ piceæ capitulo

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fuscanti; clypeus hexagonus cornu reverso abrupte truncato; thorax fere quadratus, punctatissimus, punctulis arosis tuberculo antice, fossulâque postice in medio marginis impressâ, angulis posticis in spinas productis. Scutellum parvum, nitidum. Elytra striata. Corpus subtus atrum, nitidum, punctatum. Pedes femoribus luteis, tibiis tarsisque nigro-piceis.

Long. 4½ lin.; lat. 2¼.

APHODIIDÆ.

Aphodius apicalis, Harold.

Nitidus, niger, elytris nigro-piceis, apice flavescentibus; capite antice subrugose punctato, postice lævigato, clypeo antice late truncato, auriculis prominulis; thorace parce lateribus punctato, angulis anterioribus obtusis, basi immarginato; scutello medio elevato, lateribus impresso; elytris leviter crenato-striatis, interstitiis planis, subtilissime punctatis, nitidis; palpis, antennis pedibusque nigro-piceis.

Long. 5—5½ lin.

Hab.—Nagasaki; Hakodadi; and China.

Aphodius major, sp. nov.

Aph. sorici affinis, differt scutello angustiori fere lævi; elytrorum interstitiis leviter convexis.

Niger, nitidus, convexus. Capite subtiliter punctulato punctis majoribus interspersis; fronte trituberculatâ; clypeo carinâ transversâ; genis obtusiusculis. Thorace parce fortiter punctato, antice in medio leviter impresso lævi, basi marginato, lateribus leviter rotundatis, angulis posticis sinuatis. Scutello elytrorum longitudine ⅓ æquali, sat angusto ad apicem acuminato, concavo, fere lævi. Elytris thorace ⅓ longioribus, fortiter crenato-striatis, interstitiis convexiusculis.

Long. 4 lin.; lat. 2⅓ lin.

Var. Singulo elytro apice guttâ flavâ.

Hab.—Hiogo.

Aphodius globulus, Harold, var.

Piceo-niger, opacus, convexus, brevis; clypeo leviter emarginato, valde auriculato. Thorace convexo, dense fortiter punctato. Scutello triangulari, apice acuto, basi

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punctato. Elytris obscure piceis, fortiter crenato-striatis; interstitiis sat convexis, singulis utrinque subtilius uniseriatim punctulatis, humeris sat crebre punctatis. Pedibus nigro-piceis; tarsis rufo-piceis.

Long. 2½ lin. (elytr. 1½); lat. 1⅓ lin.

I at first considered this a distinct species from *A. globulus* (and named it *A. bisectus*), but I now prefer to regard it as a local variety. It differs from the typical form of *A. globulus* in being larger, darker in colour, and almost opaque.

Hab.—Nagasaki.

✓ *Aphodius elegans*, Allibert.

Elongatus, convexus, nitidus, niger; elytris testaceis, fasciâ latâ mediâ nigrâ, ad suturam interdum interruptâ.

Long. 6—7 lin.

Hab.—China; Japan.

Aphodius lividipennis, sp. nov.

Oblongus, convexus, subopacus, ater, elytris testaceis nitidis. Capite parce obsolete punctato, antice vix emarginato, genis prominulis margine antico rufescenti, fronte obsolete unonodoso. Thorace parce fortiter punctato, antice leviter bisinuato, lateribus vix rotundatis, subparallelis margine postico immarginato. Scutello subcordato, nitido, basi vix punctulato. Elytris punctato-striatis, striâ octo antice abbreviatâ, interstitiis convexiusculis, obsolete subtilissime parce punctulatis; suturâ infuscatâ. Pedibus piceis; tarsis rufo-piceis.

Long. 3 lin. (elytr. 1⅔); lat. 1⅓ lin.

Resembles *A. scybalarius*, but is less convex; the thorax, however, has the posterior angles obliquely truncated, and the base is not margined. The scutellum is comparatively small and less acuminate. The striæ of the elytra are distinctly and strongly punctured; the suture is slightly fuscous. The basal joint of the posterior tarsi is rather long, being one-third longer than the spur on the tibia.

Hab.—Kagosima. Only two specimens.

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Aphodius diversus, sp. nov.

Oblongus, convexus, nitidus, niger (variat, elytris pallide castaneis, singulis plagâ triangulari nigrâ notatis). Capite subtilius, marginibus profundius crebre punctatis; fronte obsolete trituberculatâ; clypeo vix emarginato, genis vix prominulis, obtusis. Thorace fere ut in *A. scybalario*, parce fortiter punctato. Scutello triangulari lævi. Elytris fere ut in *A. scybalario*, dorso depressiusculo, lateribus fere parallelis, sat fortiter punctato-striatis, interstitiis planiusculis, lævibus. Pedibus piceis.

Long. 2½—3 lin.; lat. 1⅛—1½ lin.

Allied to *A. scybalarius*, but smaller, less convex, and more parallel-sided. Thorax one-fifth broader than long, gently convex, with a few large punctures on the disk, sparingly punctured towards the sides; anterior angles obtuse; the sides scarcely rounded, except in front; posterior angles very gently emarginate; the base margined.

Hab.—China and Japan. "Very common both in dung and garden refuse."

Aphodius (*Calamosternus*) *rectus*, Motsch.

"Statura et color *Cal. granarii*, sed paulo major. Elongato-subovatus, convexus, nitidus, niger; capite rugoso-punctato; thorace transverso-quadrato, sparsim grosso-punctato, angulis posticis subacutis; elytris punctato-striatis, apice palpis, antennis tarsisque rufescentibus."

Long. 2½ lin.; lat. 1¼ lin.

Hab.—Japan.

This species is unknown to me. I should have taken it to be the black form of *A. diversus* if it had not been for the words "*angulis posticis subacutis*," which will not apply to my insect.

Aphodius (*Calamosternus*) *breviusculus*, Motsch.

"Statura et color *Cal. carbonarii*, sed paulo brevior. Subelongatus, convexus, niger, nitidus; palpis, antennis tarsisque piceis, capite subrugoso-punctato; thorace transverso, convexo, punctulato, angulis obtusis; elytris thorace vix latioribus, striatis, interstitiis planiusculis, subtilissime punctulatis."

Long. 2 lin.; lat. 1 lin.

Hab.—Japan.

This species is unknown to me.

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Aphodius castaneipennis, sp. nov.

Oblongus, convexiusculus, subnitidus, niger; elytris, pedibus, tarsisque obscure castaneis. Capite parce punctulato, clypeo sat dense fortiter punctato, antice leviter emarginato, lateribus obliquis, genis prominulis. Thoracis angulis anticis parum prominulis, lateribus leviter rotundatis, basi marginato, supra parce irregulariter fortiter punctato. Scutello triangulari, lævi. Elytris sat fortiter punctato-striatis, interstitiis sub-planis, impunctatis, subnitidis.

♀. Fronte obsolete unonodosâ.

Long. $2\frac{2}{3}$ lin.; lat. $1\frac{1}{6}$ lin.

I know of no species sufficiently near for me to compare this species with.

Hab.—Nagasaki. One specimen. Coll. G. Lewis.

Aphodius nigerrimus, sp. nov.

A. constanti affinis at brevior, thorace minus crebre punctulato, elytrorum interstitiis dorsalibus convexis, lævibus. Breviter oblongus, convexus, nitidus, niger. Caput subtilissime punctulatum, antice rugulosum, fronte tritubercula tâ rugâque anticâ arcuatâ, clypeo truncato medioque leviter emarginato, genis rotundatis. Thorax convexus; ♂ dorso discrete subtiliter, lateribus crebre punctulatis; ♀ dorso sat crebre, lateribus crebrius punctatis. Scutellum basi punctulatum. Elytra convexa, parallela, crenato-striata, interstitiis dorsalibus convexis, lævibus, lateralibus subplanis, parce punctulatis.

Long. 2—$2\frac{1}{3}$ lin.; lat. 1—$1\frac{1}{6}$ lin.

This species very closely resembles *A. constans*, but is relatively shorter and less shining; the ocular canthus is more rounded, the punctuation of the thorax is less close, and, lastly, the elytra have the dorsal interstices distinctly convex.

Hab.—Nagasaki. "Garden refuse." Not uncommon.

Aphodius 4-*punctatus*, Udd.

A. sordido affinis, differt elytris interstitiis convexioribus, &c. Oblongus, convexus, luteus, nitidus; capite thoracisque disco nigro-piceis. Capite antice parce subtilissime punctulato, clypeo rufo-testaceo. Elytris testaceis, guttis duabus (unâ basali, alterâ apicali) fuscis, crenato-striatis, striis fortiter impressis; interstitiis convexis,

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singulis utrinque seriatim subtilissime punctulatis. Pedibus piceis.

♂. Clypeo discrete subtiliter punctulato; tuberculo frontali intermedio fortiore. Thorace elytris paulo latioribus, latera versus punctis adspersis.

♀. Clypeo parce obsolete punctulato; tuberculis frontalibus æqualibus. Thorace elytris paulo angustioribus, sat parce punctato.

Long. 3—3½ lin.; lat. 1¼—1⅝ lin.

This species closely resembles *A. sordidus*, but differs in having the interstices of the elytra distinctly more convex.

Hab.—Nagasaki, &c. Common.

Aphodius uniplagiatus, sp. nov.

Elongatus, convexus, niger, nitidus, elytris piceo-rufis plagâ triangulari nigrâ (basi ejus in scutello, vertice in suturâ ad apicem) notatis. Capite subtiliter punctulato, antice leviter emarginato, lateribus obliquis, genis prominulis. Thorace antice fere truncato, lateribus rufescentibus margineque postico leviter rotundatis; basi marginato. Scutello triangulato, vix punctulato. Elytris sat fortiter crenato-striatis, insterstitiis convexiusculis, lævibus. Pedibus nigro-piceis, tarsis rufescentibus.

♂. Fronte obsolete trituberculatâ; thorace sat parce distincte punctato.

♀. Fronte obsolete unonodosâ; thorace densius punctato.

Long. 2—2⅛ lin.; lat. 1 lin.

This species resembles *Aph. ferrugineus*, Muls., in general form, but is smaller; the thorax has the base distinctly but finely margined, and it is more strongly punctured. The elytra are red, with the exception of a large, black, triangular patch, the vertex of which nearly reaches to the apex of the elytra; the striæ are somewhat deep, as in *Aph. quadrimaculatus*.

Hab.—Simabara. Rare.

Aphodius uniformis, sp. nov.

Oblongus, convexus, nitidus, rufo-castaneus. Capite crebre subtiliter punctulato, antice truncato leviter emarginato, lateribus obliquis, genis prominulis obtusiusculis; fronte obsolete trituberculatâ. Thorace transverso, antice

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truncato, sat crebre subtilissime punctulato punctis majoribus interspersis, basi obsolete marginato; angulis anticis obtusis, lateribus rotundatis, angulis posticis rotundatis. Scutello triangulari, vix punctulato. Elytris thoracis latitudine, parallelis, haud profunde crenato-striatis, interstitiis subplanis, lævibus.

Long. 5 mill.; lat. 2 mill.

Very close to *Aph. ferrugineus*, Muls., but rather narrower. Cheeks a little more decidedly prominent. Base of the thorax distinctly margined. Striæ of the elytra more impressed and the interstices less flat. Basal joint of the posterior tarsi one-third longer than the calcar of the tibia, equal to the two following joints taken together.

Hab.—Hakodadi. Coll. Brit. Mus.

Aphodius impunctatus, sp. nov.

Elongatus, convexiusculus, parallelus, nitidus, fere impunctatus, piceo-castaneus.

Long. 4 lin.; lat. 1⅓ lin.

Head broad, rounded in front, with the anterior margin slightly reflexed; the clypeus sparingly and finely punctured, with the centre slightly raised, the cheeks rounded and very slightly prominent. Thorax scarcely longer than the width of the head, one-fourth broader than long, a little narrowed in front, convex, with a few punctures on the sides, the front margin nearly straight; the anterior angles slightly prominent, the sides slightly rounded; the posterior margin gently bisinuate, the posterior angles rounded, the base margined. Scutellum triangular, with the sides straight and the apex acute, impunctate. Elytra the same width as the thorax, with the sides very nearly parallel, conjointly rounded at the apex, each with nine well-defined (but lightly impressed) striæ, which are obsoletely but moderately thickly punctured, and the eighth of which is abbreviated at the shoulders; the interstices flat and impunctate. Basal joint of the posterior tarsi as long as the spur on the tibia.

Hab.—Japan. "Taken in the sandy district of Simabara in autumn."

Aphodius pallidicinctus, sp. nov.

Elongatus, convexiusculus, nitidus, nigro-piceus; elytris piceis, marginibus thoracisque lateribus testaceis. Capite

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subtiliter sat crebre punctulato, clypeo piceo distinctius punctulato, antice leviter emarginato, genis vix prominulis rotundatis. Thoracis angulis anticis obtusis, lateribus leviter rotundatis, basi immarginato, supra subtilissime punctulato, lateribus punctis majoribus aspersis. Scutello cordato, basi punctulato. Elytris sat fortiter crenato-striatis, interstitiis convexis subtilissime sat parce punctulatis. Pedibus piceis.

Long. 2⅓ lin.; lat. 1 lin.

♂. Capite trituberculato, elytris thorace parum angustioribus subparallelis.

♀. Capite obsolete trinodoso, thorace antrorsum parum rotundato-angustato, elytris thoracis latitudinem equantibus, basi parum angustioribus.

This species appears to be most allied to *A. lividus*. It differs besides in the colour, in having the outline of the head more rounded, the cheeks more obtuse. The elytra are relatively longer, less convex, more parallel; the striæ are moderately deep and somewhat strongly crenate-punctate, the interstices are gently convex.

Hab.—Nagasaki and China.

Aphodius (*Chilothorax*) *vitta*, Motsch.

"Statura *Chil. centrolineati* [*inquinatus*], sed multo major. Elongato-subovatus, convexus, nitidus, niger, elytris nigro-piceis, dorso versus scutellum rufescente, palpis tarsisque piceis, capite rugoso-punctato, trituberculato, medio transversim carinato, thorace transverso quadrato, sparsim grosso-punctato; elytris thorace vix latioribus, tenue punctato-striatis, interstitiis planiusculis."

Long. 4 lin.; lat. 1½ lin.

I am unacquainted with this species.

Aphodius obsoleteguttatus, sp. nov.

Oblongo-ovatus, convexus, niger, subnitidus; elytris testaceis obsolete octo-guttatis et fusco-marginatis. Capite clypeoque crebre sat fortiter punctatis, hoc antice leviter emarginato, lateribus obliquis, genis prominentibus obtusis. Thorace longitudine ⅓ latiori, leviter convexo, antice paulo angustato, basi tenuiter marginato, sat crebre irregulariter punctato; lateribus dense ruguloso-punctatis, obscure piceis: angulis anticis obtusis, lateribus leviter rotundatis, angulis posticis obtusis. Scutello medio punctulato. Elytris convexis, testaceis, thoracis latitudine postice ampliatis, apice

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rotundatis, crenato-striatis, interstitiis leviter convexis, parce subtilissime punctulatis; lateribus crebrius punctatis, fuscis; apice piceo. Pedibus piceis; tibiis anticis extus tridentatis; tarsorum posticorum articulo primo tribus sequentibus æquali, tibiæ calcari fere dimidio longiori.

Long. 5 mill.; lat. 2½ mill.

Closely allied to *A. pictus*, Sturm, but at once distinguished by the somewhat close punctuation of the sides of the elytra, and on the thorax. The markings on the elytra are nearly similarly placed, the dorsal spots being obscure, well separated from each other. The striæ are broader and more impressed and the interstices are more convex, &c.

Hab.—Nagasaki.

Aphodius pallidiligonis, sp. nov.

Elongatus, nitidus, niger; elytris testaceis, maculâ triangulari ad basin, margineque laterali nigris. Capite crebre ruguloso-punctato; lateribus obliquis, piceis; genis prominentibus, obtusis. Thorace longitudine ¼ latiori, convexo, basi tenuiter marginato, dorso sat crebre evidenter punctato, lateribus dense punctulatis; angulis anticis rotundatis, lateribus parallelis, angulis posticis obtusis. Scutello lævi. Elytris basi thoracis latitudine, postice paululo ampliatis, apice rotundatis, distincte punctato-striatis, interstitiis lævissime convexis, parce subtilissime punctulatis. Pedibus piceis; tarsorum posticorum articulo primo tribus sequentibus æquali, tibiarum calcare ⅓ longiori.

Long. 3¾ mill.; lat. 1¾ mill.

Allied to *A. inquinatus*, but longer and narrower, &c. The specimen described has no trace of tubercles on the clypeus. The elytra are testaceous, with a triangular spot at the base on the 2nd, 3rd and 4th interstices, and the 6th to 9th interstices nearly to the apex pitchy-black; the apex is pitchy.

Hab.—Simabara.

Aphodius punctatus, sp. nov.

Oblongus, convexus, niger, punctatus; elytris testaceo-variegatis. Capite crebre ruguloso-punctato, margine antico leviter emarginato, genis prominulis; fronte obsolete trinodosâ. Thorace antice angustiori dorso discrete punctato, lateribus dense subtiliter granuloso-punctatis;

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angulis anticis rotundatis, lateribus sub-rectis, margine postico rotundato, leviter bisinuato, basi marginato. Scutello brevi, apice rotundato, basi punctato. Elytris ad basin thoracis latitudine, postice ampliatis, leviter crenato-striatis, striis sub humeris inter puncta vix perspicuis; interstitiis 1—4 convexiusculis sat crebre fortiter punctatis, 5—7 fere planis crebre confuse punctulatis, interstitio octo convexo, punctato; apice marginibusque piceo-rufis; regione dorsali nigrâ, testaceo-maculatâ. Antennarum clavâ nigrâ. Pedibus piceis.

Long. 2½ lin.

The disk of the elytra is black; each elytron with ten yellowish spots within the black, the 1st and 2nd are on the extreme base of the 1st and 2nd interstices, the 3rd spot elongate on the 3rd interstice at a little distance from the base; the 4th on the 4th interstice and placed at the centre of the 3rd spot; the 5th is on the 3rd interstice, with its basal end a little above the lower end of the 3rd spot; the 6th spot is on the 1st interstice, a little above the 5th spot and leaving a very small black spot between this 6th and the 1st spot; the 7th spot is on the 1st interstice a little below the 6th; the 8th is a little below the 5th; the 9th (on the 3rd interstice) brackets together the 8th and 5th spots; the 10th is small and placed on the 4th interstice at the lower outer end of the 9th spot.

This species is closely allied to *A. tessulatus*, Payk., but is at once distinguished by its very strong punctuation.

Hab.—Nagasaki. Scarce.

Aphodius obsoletus, sp. nov.

A. immundo affinis, at opacus, latior, capite genis paulo prominulis.

Parum convexus, oblongo-ovalis, opacus, luteus, vertice, prothoracis disco elytrorumque suturâ infuscatis. Caput planiusculum, subtiliter crebre punctulatum, fronte muticâ, clypeo antice vix emarginato, genis vix prominulis. Thorax subtilissime sat dense punctulatis, punctis majoribus intermixtis. Elytra subtiliter crenato-striata, interstitiis planis, coriaceis, impunctis.

Long. 3 lin.; lat. 1½ lin.

Very close to *A. immundus*, Creutz., but more opaque. Head of the same form, but with the cheeks very slightly prominent, obtuse. Thorax as in *A. immundus*. Elytra

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more opaque, similarly striated, interstices coriaceous but with no visible punctuation.

Hab.—Shanghai; Japan, Nagasaki.

Aphodius ovalis, sp. nov.

This species is closely allied to *A. tristis*. It is however much shorter and more convex. The colouration is the same. The head is as in *A. tristis*, but more distinctly punctured. The thorax is a little less broad, narrowed in front, the punctuation less unequal. Scutellum triangular, scarcely punctulate at the base. Elytra relatively shorter and more convex, striated as in *A. tristis*, with the interstices shining, very nearly flat, sparingly and extremely delicately punctured. The anterior tibiæ are narrower, pitchy-black; the posterior tibiæ have the tufts of bristles on the outer edge placed in the ordinary way, and not near the base as in *A. tristis*.

Hab.—Japan. Only one specimen.

Aphodius rufangulus, sp. nov.

A. pusillo, Herbst. affinis, at minus convexus. Capite, ut in *A. pusillo*, nigro, crebre distincte punctulato, genis paulo prominulis. Thorace nigro, leviter convexo, nitido, angulis anticis obtusis, rubris, posticis obtusis. Scutello subopaco, basi punctulato. Elytris thorace vix latioribus, fortiter crenato-striatis, piceis, humeris apiceque rufescentibus. Pedibus piceis.

♂. Thorace transversim quadrato, sat crebre subtilissime punctulato punctis majoribus interspersis, angulis anticis obtusis, lateribus leviter rotundatis, basi marginato. Elytrorum interstitiis planiusculis, subopacis, parce subtilissime punctulatis.

♀. Thorace antice paulo angustato, fortius punctato. Elytrorum interstitiis convexis, nitidis, fere lævibus.

Long. 3—4 mill.; lat. 1½—2 mill.

This species closely resembles *A. pusillus* (especially the ♀). It is, however, less convex; the cheeks are a little more prominent; the punctuation on the thorax is rather closer, and the elytra in the ♂ are somewhat dull.

Hab.—Nagasaki, Hiogo, Awomori. Common.

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Aphodius urostigma, Harold.

A. pallidicorni, Walker, affinis, at longior, elytrorum interstitiis apicem versus serie punctorum minutorum notatis.

Convexus, elongatus, nitidus, niger; capite punctulato, mutico, clypeo rotundato, integro, genis vix prominulis; thorace latera versus margineque antico discrete punctato, disco lævi, basi immarginato; scutello brevi, acuminato, lævi; elytris sat fortiter striatis, striis obsolete punctulatis, interstitiis convexiusculis, lævibus, apicem versus serie punctorum minutorum notatis. Clypei margine pedibusque piceis.

Long. 2½ lin.; lat. 1 lin.

This species is peculiar, on account of the elytra being somewhat attenuated posteriorly, and for the long hairs which margin the thorax and elytra. *A. pallidicornis* of Walker is shorter than the one here described, and appears to be constantly piceous; the interstices of the elytra have each a series of somewhat large punctures from the base to the apex. *A. urostigma* has the sides of the thorax gently rounded in front, sub-parallel behind; and the interstices of the elytra have no trace of punctures, except near the apex, where there is a series of very small punctures on the inner side.

Hab.—Japan; Hong Kong; Ceylon. Common.

Aphodius variabilis, sp. nov.

A. contaminato, Herbst. affinis; differt thorace lateribus minus rotundatis, supra subtiliter discrete punctulato (♂), vel sat crebre distincte punctato (♀). Scutello piceo. Elytris postice vix ampliatis, regulariter crenato-striatis, interstitiis lævibus.

Long. 3 lin.; lat. 1¼ lin.

Head as in *A. contaminatus*; very finely, and not very thickly, punctured in the ♂; thickly, and somewhat strongly, punctured in the female. Thorax one-fifth broader than long, gently convex, shining; ♂, anterior angles obtuse, and not prominent; the sides gently rounded in front, nearly parallel behind; ♀, thorax narrower, gradually narrowed towards the front. Elytra scarcely as broad as the thorax in the ♂; as wide as the thorax in the ♀; very slightly enlarged posteriorly; narrowed towards

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the apex; testaceous, with the margins pitchy, evenly and cleanly crenate-striate; the striæ rather deep; the interstices moderately convex, smooth, with a series of extremely fine punctures not very close together on each side of every interstice. There is a pitchy-black oblong spot on the base of the fourth interstice; also a black patch occupying the disk of each elytron, and extending in a point to the shoulder; this patch is very frequently broken up into spots, forming two oblique bands. Legs pitchy-testaceous.

Hab.—Japan, Nipon and Kiushiu. Common.

Aphodius (*Melinopterus*) *nigrotessellatus*, Motsch.

"Statura et color *Mel. contaminati*, sed minor et thorace angustiore. Elongato-subovatus, convexus, nitidus, niger, elytris testaceis, tessellatim nigro-maculatis, marginis rufescentibus; capite dense punctulato, tuberculis tribus minutis carinæ-formibus; thorace transversim quadrato, punctatissimo, lateribus rufescentibus; elytris profunde punctato-striatis, interstitiis subconvexis; scutello nigro."

Long. 2 lin.; lat. 1 lin.

Hab.—Japan.

I have not seen this species.

Aphodius atratus, sp. nov.

A. lurido affinis, at minor, minus depressus, elytrorum interstitiis crebrius punctato, &c.

Subdepressus, oblongo-ovalis, parum nitidus, niger. Caput crebre distincte punctulatum, muticum, clypeo semicirculari. Thorax sat dense punctulatus. Elytra crenato-striata. Pedes piceo-nigri; tarsis piceis.

♂. Capite lato, genis prominentibus rectangularibus. Thorace transverso, antice vix angustiori, angulis anticis rotundatis, lateribus leviter rotundatis. Elytris leviter crenato-striatis; interstitiis subplanis discrete distincte punctatis, singulis intus longitudinaliter lævissime impressis.

♀. Capite crebrius fortius punctato. Thorace antice angustato, crebre inæqualiter punctato. Elytris convexioribus, lateribus rotundatis, leviter crenato-striatis; interstitiis convexis sat crebre irregulariter punctato, sin-

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gulis intus longitudinaliter impressis, inde fit ut interstitia subcariniformia appareant.

Long. 2½—3 lin.; lat. 1⅓—1⅔ lin.

Hab.—Nagasaki; Hiogo.

Aphodius rugosostriatus, sp. nov.

Obongus, convexiusculus, nitidus, piceus. Caput subtiliter discrete punctulatum; clypeo subtilissime obsolete punctulato, semicirculari, antice leviter emarginato, genis prominulis sub-acutis; fronte unonodosâ. Thorax transversus, subtilissime sat crebre punctulatus, postice et latera versus punctis majoribus interspersis; angulis anticis obtusis, lateribus leviter rotundatis, angulis posticis obtusis; basi immarginato, rotundato. Scutellum apice acuminatum, basi punctulatum. Elytra thoracis latitudinem æquantia, at fere duplo longiora, postice paulo ampliata, fortiter crenato-striata, striis fortiter impressis latis, interstitiis angustis convexis, subcariniformibus, parce subtilissime punctulatis. Antennis luteis.

Long. 2⅔ lin.; lat. 1¼ lin.

This species appears allied to *A. depressus*, but is very unlike any species belonging to this group with which I am acquainted. The head is nearly of the same form, but is less rounded in front, with the sides oblique, and with the suture separating the clypeus slightly indicated. The thorax is less broad in proportion; the anterior angles less rounded; the posterior angles more obtuse; the lateral margination less strong. The scutellum is smaller in proportion. The elytra are less emarginate at the base; the striæ are very deep, sulciform, strongly crenate.

In some respects, especially in the sulcation of the elytra, this species resembles *Oxyomus villosus*.

Hab.—Kobé Watercourse. One specimen. 1871.

Aphodius Lewisii, sp. nov.

Elongato-oblongus, subopacus, brunneo-testaceus. Capite piceo, subtiliter discrete punctulato; oculis magnis; clypeo rufo-testaceo, sat crebre subtiliter punctulato, in medio vix unituberculato, antice leviter sinuato; genis paululo prominulis, obtusis. Thorace longitudine ¼ latiori, leviter convexo, crebre punctulatis (punctis perparvis majoribusque intermixtis); angulis anticis posticisque rotundatis; lateribus fere rectis, subparallelis;

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margine postico leviter bisinuato haud marginato. Scutello elongato, lævi. Elytris thoracis latitudini æqualibus, at duplo longioribus, apicem versus arcuatim attenuatis, singulis novem-costatis (costis sexto octoque abbreviatis), sulcis inter costas singulis bi-carinulatis et inter carinulis subtiliter crenato-striatis. Tibiis anticis extus tridentatis. Tarsorum posticorum articulo primo elongato, calcare ⅓ longiori, articulo quatuor sequente æquante.

Long. 3½ mill.; lat. 1½ mill.

I have no named species with which to compare this species.

Hab.—Osaka. "Taken in September in some numbers from rotten tomatoes."

Ammœcius nitidulus, sp. nov.

Statura *Amm. gibbi*, at niger, nitidus, elytrorum humeris rotundatis.

Niger, nitidus, convexus. Capite parce subtiliter punctulato; fronte obsolete trituberculatâ; clypeo obsolete punctulato, antice rugâ transversâ instructo, apice emarginato, angulis obtusis; genis prominulis rotundatis. Thorace transverso, antice angustato, convexo, basi marginato, crebre punctato (punctis minutis majoribusque intermixtis), angulis posticis obtusis. Scutello basi vix punctulato. Elytris basi thorace vix latioribus, postice ampliatis, convexis, nitidis, leviter crenato-striatis, interstitiis fere planis, parce subseriatim subtilissime punctulatis, lateribus minus nitidis subtilissime aciculatis, humeris obtusis. Pedibus nigro-piceis; tarsis piceis.

Long. 2 lin.

This species resembles *Amm. gibbus* in general form, The head is similar, except that the angles made by the anterior emargination are rounded; the cheeks are a little more prominent. The thorax is similar, except that the posterior angles are more obtuse. The elytra are relatively longer, and have the shoulders obtuse.

Hab.—Nagasaki. One specimen. Coll. Lewis.

Saprosites japonicus, sp. nov.

Elongatus, parallelus, niger, nitidus. Capite convexo, subtiliter crebre punctulato, antice leviter emarginato, genis prominulis subacutis, margine piceo. Thorace capite paulo latiori, sat transverso, postice paululo angus-

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tato, ad basin marginato, discrete fortiter punctato latera versus crebrius punctato, angulis anticis piceis obtusiusculis, lateribus vix rotundatis, angulis posticis rotundatis. Elytris thoracis latitudine, parallelis, fortiter striatis, striis fortiter punctatis, interstitiis convexis, lævibus; humeris dente perparvo instructis. Corpore subtus nigro-piceo, nitido; mesosterni carinâ distinctâ; metasterno lævi, longitudinaliter sulcato et in medio impresso; abdomine lævi, segmentis singulis basi fortiter sulcatis et punctatis. Pedibus piceis, tibiis anticis tridentatis; tarsorum posticorum articulo primo tibiæ calcare haud longiori.

Long. 4 mill.; lat. 1⅓ mill.

To the above description I need only add that the punctures in the striæ of the elytra are separated from each other by intervals scarcely less than their diameter.

Hab.—Nagasaki. "Old trees; apparently attracted by sap. Rather scarce."

Rhyssemus asperulus, sp. nov.

Oblongus, convexus, griseo-ater. Capite crebre asperato-punctato. Thorace longitudine ⅓ latiori, transversim crebre ruguloso-punctato, carinis transversis quatuor. Elytris convexis, thorace haud latioribus, postice paululo ampliatis, fortiter crenato-striatis, interstitiis angustis, moniliformibus. Pedibus nigro-piceis; tarsis piceis.

Long. 3¼ mill.; lat. 1⅓ mill.

Very close to *R. germanus*, but relatively shorter and broader. The thorax is less transverse, the transverse carinæ are more decidedly in pairs, and the anterior pair are further from the anterior margin. The elytra are shorter and the striæ deeper.

Hab.—Nagasaki. "In garden refuse."

Psammodius convexus, sp. nov.

Ovatus, convexus, nitidus, castaneus. Clypeo asperato; collo fere impunctato, utrinque oblique bicarinato; genis fere rectangularibus, obtusiusculis. Thorace nigro-castaneo, longitudine fere duplo latiori, convexo, antice angustato, transversim quinque-carinato, carinis nitidis (duabus posterioribus in medio interruptis), inter carinas obsolete punctato; angulis anticis obtusis, posticis omnino rotundatis; margine postico leviter bisinuato. Scutello lævi. Elytris basi thorace paululo angustioribus, postice

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ampliatis, convexis, sat fortiter crenato-striatis, interstitiis convexiusculis. Tibiis anticis obtuse tridentatis, posticis intus lævibus extus ruguloso-serratis, ad apicem dilatatis. Tarsis brevibus, articulo primo dilatato, calcare dimidio breviori.

Long. 3 mill.; lat. (post.) 1½ mill.

Very close to *P. sulcicollis* and of the same form, but differs in having the elytra crenate-striate, not sulcate, and the interstices are broad and nearly flat.

Hab.—Kobé; sand hills. "Two specimens in May, 1871."

Ægialia nitida, sp. nov.

Ovata, convexa, nitida, piceo-nigra. Capite convexo, postice lævi; clypeo asperato, antice leviter emarginato; genis nullis. Thorace convexo, nitido, longitudine duplo longiori, dorsim parce subtiliter punctulato, antice angustato, angulis anticis acutiusculis, lateribus rectis, angulis posticis rotundatis. Elytris basi thorace paululo angustioribus, postice ampliatis, convexis, sat fortiter striatis, striis obsolete crenatis; interstitiis juxta suturam convexis, latera versus convexiusculis, lævibus. Pedibus piceis.

Long. 4 lin.; lat. (post.) 2 lin.

Near *Æ. arenaria*, but rather narrower, the thorax is distinctly although very finely punctured on the disk, and there is a very slight impression in the middle of the posterior margin; the elytra are relatively longer and narrower, the striæ are deeper (obscurely crenated) and the interstices are more convex.

Hab.—N. Japan (Hakodadi). Coll. Lewis.

GEOTRUPIDÆ.

Ochodæus maculatus, sp. nov. (Pl. III. fig. 1.)

Ovatus, convexiusculus, niger, rugulosus, pubescens. Thoracis lateribus femoribusque rufo-testaceis, elytris brunneis nigro-maculatis. Caput nigrum, planum, postice angustatum, rotundatum, crebre granulosum, griseo-hirtum; collo supra excavato, excavatione nitidâ fere lævi; oculis prominentibus; clypeo antice angustato, ♀ bituberculato, ♂ lateribus reflexis; antennis piceis, clavâ nigrâ nitidâ punctatâ apice flavâ. Thorax fortiter transversus,

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convexus, niger, crebre granulosus, longe flavo-hirtus, antice fortiter rotundato-emarginatus, postice bisinuatus; angulis anticis rectangularibus, lateribus angulisque posticis rotundatis. Scutellum elongatum, acuminatum, nigrum, punctatum. Elytra brevia, dorsim depressa, brunnea (maculâ humerali, fasciâ mediâ apiceque nigris), punctato-striata, interstitiis convexiusculis, subtilius crebre granulosis. Corpus subtus nigrum, nitidum, crebre punctatum. Pedes nigri, femoribus intermediis posticisque testaceis; tibiis anticis apice bidentatis; tarsis posticis longis, articulo basali tibiâ $\frac{1}{3}$ breviori.

Long. 5 lin.; lat. $2\frac{2}{3}$ lin.

This insect resembles an *Athyreus* in general appearance, but the well-developed abdomen and the structure of the antennæ and the scutellum leave no room for doubt that it should be placed in the genus *Ochodæus*; it is remarkable, however, for the great length of the basal joint of the posterior tarsus, which equals the four following joints taken together.

Hab.—"Simabara. One specimen from a dead dog, May; a second from Tagami, in a bottle set with meat."

Bolboceras nigroplagiatum.

B. farcto simillimum; differt thorace latera versus crebre fortiter punctato nitido.

Rufo-testaceum, nitidum, convexum. Capite, thoracis basi in medio, scutello, elytrorumque lateribus nigris. Thorace semicirculari, antice emarginato, postice bisinuato, nitido, dorsim parce latera versus crebre fortiter punctato, postice in medio nigro, lineâque longitudinali punctatâ, antice impresso, carinâ transversâ arcuatâ nigrâ instructo. Scutello nigro, fere lævi. Elytris lateribus parum rotundatis, nigris, plagâ magnâ triangulari rufâ, fortiter punctato-striatis, interstitiis convexis.

Long. $5\frac{3}{4}$ lin.; lat. $3\frac{1}{2}$ lin.

This species is extremely close to *B. farctum*. It differs in being slightly less convex and in having the elytra less rounded at the sides. The sides of the thorax, especially near the anterior angles, are in *B. farctum* opaque and minutely granulate, whereas in the Japanese species this part of the thorax is thickly and somewhat strongly punctured and not opaque.

The head is rugulose, with a transverse carina behind; the clypeus is furnished in front with a minute (almost

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obsolete) tubercle. The elytra have each seven impressed striæ and three rows of punctures at the sides.

Hab.—Japan; Nagasaki and Corea.

Geotrupes (*Phelotrupes*) *lævistriatus*, Motsch.

The colour of this insect is generally æneous, but it is sometimes purple-blue or blue. The depth of the striæ varies much, and the form in which they are very slightly impressed and scarcely punctured, from which the species derives its name, is less common than those in which the striæ are more deeply impressed.

The ♂ of this species is easily recognized by the single strong tooth on the under side near the base of the anterior tibia.

Hab.—Japan and Celebes.

Geotrupes (*Phelotrupes*) *auratus*, Motsch.

Hab.—Japan and Tartary.

Geotrupes (*Phelotrupes*) *purpurascens*, sp. nov.

Latus, leviter convexus, nitidus, purpurascens, cupreo-micans. Thorace longitudine duplo latiori, convexo, pone medium ampliato, ad latera fortiter punctato, angulis anticis obtusis, lateribus fortiter rotundatis, angulis posticis obtusis. Scutello lævi. Elytris thorace vix duplo longioribus, 13-striatis, striis septem dorsalibus sat fortiter impressis, punctatis, interstitiis convexis; marginibus reflexis. Corpore subtus pedibusque viridi-aureis.

♂. Tibiis anticis extus 7-dentatis, subtus dentibus quinque armatis. Femoribus posterioribus dente forte armatis.

♀. Tibiis anticis subtus obsolete tri-nodosis. Femoribus simplicibus.

Long. 9—10 lin.; lat. 5—5¾ lin.

This species, which I separate very reluctantly from *G. auratus*, Motsch., differs from that insect in being of a dull purple colour, with the margins of the thorax and elytra and the striæ of the latter bright coppery. The thorax is broader than the elytra, slightly angulated behind the middle, whilst in *G. auratus* the thorax is only as broad as the elytra, and evenly rounded at the sides, and the colour is a uniform bright coppery.

Hab.—Japan (Hakodadi and Yokohama); Celebes.

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Geotrupes splendidus is recorded by Motschulsky as coming from Japan, but I have never seen it from that locality.

TROGIDÆ.

Trox setifer, sp. nov.

Nigro-griseus, opacus, elongatus, convexus, antice angustatus. Clypeo transverso, rotundato, sat crebre ruguloso-punctato; fronte fortius punctatâ, postice maculis minutis quatuor piliferis ornatâ; antennis ferrugineis. Thorace sat transverso, crebre sat fortiter punctato, longitudinaliter canaliculato, utrinque obsolete bi-impresso, punctis setiferis; margine antico bisinuato, angulis anticis acutis; lateribus antice leviter rotundatis, dein subparallelis, ante angulis posticis leviter sinuatis, his fere rectis; margine postico in medio leviter lobato, hoc marginibusque lateralibus setiferis. Elytris basi thorace paululo latioribus, convexis, postice ampliatis, sat fortiter punctato-striatis, interstitiis planis, 1, 3, 5, 7 tuberculis minutis setiferis, 4, 6, 8 tuberculis majoribus ornatis, interstitio secundo tuberculis elongatis, basi confluentibus setiferis; marginibus obscure purpureis. Tibiis anticis apice dilatatis, extus quadridentatis, dentibus basalibus minutis.

Long. 5½ lin.; lat. (postice) 3 lin.

The suture of the elytra is slightly raised and furnished with a series of minute tufts of short fulvous bristles; the punctures in the striæ are very distinct, and are not placed very close together.

Hab.—Simabara.

Two specimens found in a dead snake in May, 1870, by Mr. Lewis.

Trox obscurus, sp. nov.

Cinereus, opacus. Capite thoraceque obscure albido-tectis, illo binoduloso, hoc supra tuberculis quinque. Elytris thoracis latitudine postice paulo ampliatis, obsolete striato-punctatis, seriebus circiter octo tuberculorum parvorum flavo-tomentosorum, serieque tuberculorum oblongorum majorum prope suturam, hic et illic maculis parvis nitidis nigris. Corpore subtus pedibusque griseo-albo tectis, abdomine nigro.

Long. 6 lin.; lat. 3½ lin.

Head flat, acuminate in front, clothed with dirty-white tomentum; forehead with two approximate, transverse,

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brown tubercles. Thorax convex, clothed with dirty-white tomentum, thickly punctured, broadly lobed over the head, anterior angles obtuse, the sides slightly rounded in front and then gently emarginate before a lateral projection, which has its apex rounded; the posterior angles obsolete; the posterior margin gently flexuous, with a projecting lobe over the scutellum. The thorax above is furnished with a triangular raised portion (divided in the middle by a furrow), the base of which forms the anterior margin of the thorax, and the apex is directed backwards; on each side it is emarginate in the middle. There is, moreover, on each side, at the posterior angle, a kidney-shaped tubercle, and two others placed on the hind margin, one on each side, near the scutellum. The scutellum is trefoil-shaped. The elytra are ashy-grey, about $2\frac{3}{4}$ times as long as the thorax, rather broader posteriorly, with the sides straight in the middle; they are obscurely punctured in lines, with about eight rows of small, oblong, only slightly-raised tubercles; the tubercles in the second row are distinctly larger and are black at the base. Here and there on the elytra are shining black spots.

Hab.—Hong Kong; Japan.

Trox opacotuberculatus, Motsch.

"Figura *Tr. scabri*, L., sed elytris utrinque tuberculis magnis, oblongis, opacis, qudruplici serie; ater, opacus, thorace transverso, antice et postice lato, trifoveolato; elytris thorace paulo latioribus, tuberculis oblongis, brevissime fusco-puberulis, utrinque qudruplici serie; postice tuberculis quinque approximatis, transversim dispositis, utrinque elevatis, interstitiis planiusculis, tuberculis minutissimis laxe adspersis."

Long. $2\frac{1}{3}$ lin.; lat. (elytr. post.) $1\frac{1}{3}$ lin.

Hab.—Japan; Hakodadi; Nagasaki.

MELOLONTHIDÆ.

Ectinohoplia variolosa, sp. nov. (Pl. III. fig. 2.)

Capite nigro; clypeo piceo, angulis rotundatis, margine vix reflexo. Thorace capite fere duplo latiori, transverso, leviter convexo, antice leviter bisinuato, postice rotundato, angulis anticis fere acutis, lateribus angulisque posticis rotundatis. Scutello elongato triangulari, apice acuto. Elytris thorace paulo latioribus et duplo longioribus, planis, subquadrangularibus, humeris obtusis, lateribus

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fere rectis, deflexis, singulis ad apicem rotundatis. Antennis pedibusque rufo-testaceis, perlongis, parce argenteo-squamulatis.

Capite sat dense viridi-argenteo-squamulato; thorace dense viridi-squamulato, lineis longitudinalibus quatuor nigris, duabus lateralibus obliquis. Scutello elytrisque viridi-squamulatis, nigro-lineatis. Corpore subtus squamis viridi-albis dense tecto, nigro punctato.

Var. Capite, thorace, elytrisque totis nigro-squamatis.

Long. 3½ lin.; lat. 2 lin.

Hab.—Nagasaki (abundant in May); frequents especially the dog-rose.

Hoplia communis, sp. nov.

♂. Nigro-picea, supra dense squamulis obscure aureo-viridibus tecta, subtus squamis viridibus et cupreis crebre aspersis. Capite, clypeo transverso, piceo, antice leviter emarginato, angulis rotundatis, marginibus reflexis. Thorace leviter convexo, antice et postice paulo angustato, margine postico arcuato utrinque leviter sinuato, angulis posticis obtusis, fere rotundatis. Scutello parvo. Elytris basi thoracis latitudinem æquantibus, postice ampliatis, singulis ad apicem rotundatis. Pedibus longis.

Long. 3½—4 lin.; lat. 1⅔—2 lin.

♀. Corpore convexiori, pedibus brevioribus.

Var. Supra flavo-squamosa; pedibus antennisque piceis.

This species is allied to *H. farinosa*, Linn. The thorax is relatively shorter, more narrowed posteriorly where it is narrower than the base of the elytra; the posterior margin is somewhat lobed in the middle.

Hab.—Nagasaki; Yokohama.

Hoplia mœrens, sp. nov.

Fusco-nigra; scutello corporeque subtus dense squamis argentiacis tectis. Capite, clypeo transverso, antice recte truncato, angulis obtusis, marginibus reflexis, lateribus parallelis. Thorace capite duplo latiori, longitudine ⅓ latiori, leviter convexo, crebre subtiliter asperato-punctulato et brevissime griseo-pubescenti, antice leviter emarginato, angulis anticis vix obtusis, lateribus antice leviter rotundatis, angulis posticis obtusiusculis, margine postico arcuato. Scutello parvo, squamis argenteis tecto. Elytris thorace paulo latioribus, sat convexis, dorsim depressis, crebre subtiliter asperato-punctulatis et brevissime griseo-

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pilosis, lateribus leviter rotundatis, singulis ad apicem rotundatis. Pedibus longis, parce setis argenteo-viridibus ornatis; unguibus piceis.

Long. 3¼ lin.; lat. 1⅘ lin.

Hab.—Hiogo, Nagasaki, &c.

Serica boops, sp. nov. (Pl. III. fig. 3.)

Oblongo-ovata, brunneo-testacea, subopaca. Capite piceo-nigro; fronte discrete punctulatâ; clypeo ut in *Sericâ brunneâ* at angulis minus rotundatis, et antennis longioribus, oculis majoribus. Thorace transverso, leviter convexo, longitudine ⅓ latiori, antice capite (oculis inclusis) vix angustiori, postice paulo latiori, margine antico utrinque sinuato, angulis anticis acutis, lateribus vix rotundatis, angulis posticis rectis, disco fusco. Scutello elongato-triangulari, crebre punctato. Elytris basi thoracis latitudinem æquantibus at 3½ longioribus, postice paulo ampliatis, leviter convexis, obscure testaceis, distincte striatis, striis crebre irregulariter punctatis, interstitiis convexiusculis, irregulariter nigro-guttatis, parce punctatis, punctis nonnullis brevissime setiferis.

Long. 3¾ lin.; lat. 2 lin.

Allied to *S. brunnea*, but (besides the colouration) distinguished by the larger and more prominent eyes, by the slightly more transverse thorax, which is more sinuated in front, by the scutellum being very distinctly punctured and having the apex less acute, and by the striæ of the elytra being composed of a single irregular line of punctures.

Hab.—End of June, on Maiyasan, Hiogo; flying at dusk.

Serica brunnea, Linn.

Hab.—Various parts of Japan.

Serica grisea, Motsch.

Serica? grisea, Motsch. Bull. Mosc. 1866, i. p. 171.

Statura *Ser. brunneæ*, sed brevior. Elongata, parallela, subconvexa, nigra, dense griseo-pubescens, antennarum basi, tibiis tarsisque brunneis; fronte antice transversim impressâ, antennarum clavâ longiusculâ, 3-articulatâ; thorace transverso, punctulato; elytris thorace paulo latioribus, quadrangulatis, striatis, interstitiis subconvexis, punctatis; tibiis anticis bidentatis.

Long. 3 lin.; lat. 1¾ lin.

Hab.—Japan.

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Serica polita, Gebler.

S. polita, Gebler, Nouv. Mém. Mosc. ii. p. 52.

This is an extremely variable insect. The ordinary colouration brownish-testaceous, with a slight æneous reflection, but sometimes the head and thorax are bluish-æneous, and rarely the whole insect is greyish-æneous. It is this last variety which I have determined to be *S. polita* of Gebler. In Mr. Lewis' collection there is a specimen, in bad condition, of an insect which agrees very well with Motschulsky's description of *S. grisea*, and it appears to me to be very probable that this is only a variety of *S. polita*. I see only colour-differences, but do not like to unite the two upon such slight evidence.

Hab.—Japan; Dauria.

Serica japonica, Motsch.

S. japonica, Motsch. Etud. Ent. 1860, p. 15.

"Ovata, convexa, sparsim punctata, velutina, rufo-castanea, oculis nigris, nitidis; clypeo truncato, reflexo, confertim fortiter punctato; thorace transverso, antice arcuatim angustato, sparsim punctato, angulis anticis prominulis, posticis rectis; elytris thorace paulo latioribus, ovatis, striatis, interstitiis subconvexis, sparsim punctatis; corpore subtus punctato, opaco.

"Long. 3 lin.; lat. elytr. 2½ lin."

In this (as was evidently Motschulsky's frequent custom) the author took the measurements from an inch divided into eighths instead of twelfths. The size should be 4½ lin., 3¼ lin.

Hab.—Japan, in all the islands; Hong Kong.

Serica orientalis, Motsch.

S. orientalis, Motsch. Etud. Ent. 1857, p. 33.

Hab.—Japan; Mongolia. Common.

Apogonia splendida, Bohem.

Ap. splendida, Bohem. Res. Eugenies, p. 55.

Breviter ovata, convexa, nitida. Capite cupreo, parce, clypeo profunde punctato. Thorace cupreo, parce punctu-

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lato. Scutello lævi. Elytris cupreo-æneis, sat crebre fortius punctatis.

Long. 9, lat. 5 mill.

Var. Elytris castaneis.

Hab.—Japan; Hong Hong, &c.

Apogonia major, sp. nov.

Oblonga, convexa, nitida, cuprascens. Capite lato, modice convexo, cupreo-nigro, crebre fortiter punctato; clypeo fortius punctato antice emarginato, angulis late rotundatis. Thorace longitudine fere duplo latiori, sat crebre fortiter punctato, disco antice leviter bi-impresso, angulis anticis supra impressis prominulis, lateribus leviter rotundatis, angulis posticis obtusis (fere rotundatis). Scutello triangulari, lævi. Elytris basi thorace vix latioribus, at quadruplo longioribus, postice perpaulo ampliatis, ad apicem obtusis, sat crebre fortiter punctatis, bicostatis; costis parum elevatis, parce punctulatis, costâ interiori latiori. Tarsis piceo-nigris. Antennis palpisque piceis.

Long. 5—6 lin.; lat. 3—3½ lin.

Hab.—Nagasaki.

Holotrichia parallela, Motsch.

"Nigro-picea, subopaca, grosso-parcius-punctata; thoracis lateribus arcuatis, angulis posticis rectis, elytris tricostis.

"Long. 8 lin.; lat. 4 lin."

Hab.—Shanghai; Formosa; Japan.

Holotrichia picea, sp. nov.

Nigro-picea, subparallela, convexiuscula. Capite lato, sat fortiter rugoso-punctato, clypeo leviter emarginato, vertice postice fere carinato, post carinam subito lævi. Thorace longitudine duplo latiori, discrete latera versus sat crebre punctato, antice angustato, postice vix angustato, margine antico leviter emarginato, angulis anticis obtusis, posticis rectis. Scutello discrete punctulato. Elytris thoracis latitudine, postice paulo ampliatis, convexiusculis, sat crebre fortiter punctatis; suturâ lineisque quatuor elevatis, quarum unâ suturali postice latâ; capitis thoracisque marginibus longe parce pilosis.

Long. 9 lin.; lat. 4½ lin.

Var. Rufo-picea.

This and the preceding species are closely allied. The

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insect which I suppose to be *H. parallela* of Motsch., from the above diagnosis (given in the Étud. Ent. 1854, p. 64), differs from *H. picea* in having the head less thickly and less rugosely punctured; the neck is finely punctured and is not separated from the forehead by any distinct line; the thorax is the same form, but is rather less thickly and more strongly punctured; the margins are very slightly crenulate and have only short hairs; lastly, the raised stria next the suture, which in both becomes very dilated posteriorly, never unites with the suture, whereas in *H. picea* it approaches and nearly joins the suture some distance before the apex. In both species the tarsi are longer in the males.

Hab.—Nagasaki; Hakodadi.

Holotrichia morosa, sp. nov.

H. piceæ persimilis, at fere nigra, tota pruinosa, convexior.

Long. 10 lin.

This insect only differs from *H. picea* in being more convex, nearly black, and opaque through the pruinose surface. The club of the antennæ is very small, not longer than the four preceding joints taken together, whereas in *H. picea* the club is nearly as long as the six preceding joints.

I at first believed this to be the ♀ of *H. picea*, but from dissection this is evidently not the case.

Hab.—Nagasaki; Chee-foo.

Holotrichia castanea, sp. nov.

H. sinensi affinis. Oblonga, castanea, elytris nitidis. Capite lato, confertim punctato, clypeo leviter emarginato, fronte transversim carinatâ. Thorace convexo, antice paulo angustato, longitudine ⅓ latiori, margine antico vix emarginato, angulis anticis obtusiusculis, lateribus arcuatis, angulis posticis obtusis, fere rotundatis, superne confertim subtiliter punctato. Scutello confertim punctato. Elytris thoracis latitudine postice paulo ampliatis, ad apicem rotundatis, crebre fortiter punctatis, suturâ late paulo elevatâ.

Long. 9½ lin.; lat. 5 lin.

Closely allied to *H. sinensis*, Hope, but that species has the thorax and base of the elytra blackish. The sides

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of the thorax are not angulated as they are in *H. sinensis*, and the punctuation is somewhat finer; the front margin is very much less emarginate, and consequently the angles are not prominent. The punctuation of the elytra is equal all over, somewhat stronger than in *H. sinensis*. Both species have a smooth line near the lateral margin, but have no raised lines on the disk.

Hab.—Kawachi.

Holotrichia transversa, Motsch.

H. transversa, Motsch. Etud. Ent. 1860, p. 15.

"Tantum *Hol. serricolli*, Mots. E. E. 1853, 46 (Ancyl.), sed fronte convexiore, nitidiore, læviore, sparsim grosso-punctato, carinula transversa, postice nulla, clypeo inter antennas transversim impresso; thorace valde transverso, sparsim grosso-punctato, lateribus arcuatis, medio dilatatis, antice crenatis; elytris basi thorace paulo angustioribus, postice dilatatis, sparsim punctatis, sutura subelevata, utrinque nervis duobus obliquis vix distinctis, abdomine subinflato pygidioque sparsim punctato, corpore subtus vix piloso."

"Long. 4½ lin.; lat. elytr. post. 2½ lin."

Hab.—Japan.

POLLAPLONYX, gen. nov.

Corpus elongatum. Labrum fortiter triangulariter excisum. Palpi maxillari prælongi; articulo secundo elongato; tertio brevi; apicali in ♂ securiformi, in ♀ præcedenti triplo longiori, subinflato, apice subtruncato. Antennæ articulo primo elongato, secundo dimidio brevi, 3, 4 et 5 paulo longioribus sub-æqualibus, 4 et 5 fere conjunctis, 6 et 7 transversis, clavâ triarticulatâ elongatâ (♂) vel ovali (♀). Tibiis anticis maris vix bidentatis, fœminæ apice bidentatis. Unguibus basi dentatis, apice fissis.

This genus is allied to *Atys*.

Pollaplonyx flavidus, sp. nov. (Pl. III. fig. 6.)

♂. Elongatus, depressus, flavus, nitidus. Fronte obsolete tri-impressâ discrete fortiter punctatâ, clypeo fere semicirculari, discrete fortiter punctato, antice acute inciso. Thorace transverso, discrete fortiter punctato, longitudine ⅔ latiori, antice vix sinuato, angulis anticis obtusis, late-

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ribus rotundatis (medio vix angulatis), angulis posticis obtusis, margine postico fere truncato. Scutello lævi. Elytris basi thorace paulo angustioribus et triplo longioribus, postice ampliatis, leviter convexis, sat crebre fortiter punctatis, singulis nervis quatuor, duobus exterioribus angustis. Pedibus longis; tibiis anterioribus angustis, extus bidentatis; unguibus basi dentatis, apice fissis.

Heptophylla picea, Motsch.

H. picea, Motsch. Etud. Ent. 1857, p. 32.

Hab.—Nagasaki; Yokohama.

Granida albolineata, Motsch. (Pl. III. fig. 7.)

G. albolineata, Motsch. Etud. Ent. 1861, p. 8.

Hab.—Nagasaki (rare); Nipon (not uncommon).

Hoplosternus japonicus, Harold.

H. japonicus, Harold, Abhandl. Nat. Ver. Bremen, iv. 1874, p. 291.

"Elongatus, sat convexus, fusco-rufus, elytris dilutius rufis, dense, elytris longius flavo-pilosis; capite thoraceque densissime punctulatis, elytris præterea punctis majoribus parum profundis.

"Long. 26—29 mill."

Allied to *H. chinensis*.

Hab.—Osaka (in the month of May).

Melolontha japonica, Burm.

M. japonica, Burm. Handb. iv. p. 420.

Hab.—Yokohama; Hiogo; Nagasaki (in May).

RUTELIDÆ.

Phyllopertha horticola, Linn.

Hab.—Chowsan; Manchuria; Hakodadi.

Phyllopertha diversa, sp. nov. (Pl. III. fig. 5.)

♂. Oblonga, depressa, nigra. Capite ruguloso-punctato, margine antico reflexo, angulis rotundatis. Thorace (antice capite vix latiori) leviter convexo, sat crebre for-

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titer punctato, longitudine duplo latiori, lateribus post medium leviter sinuatis; angulis anticis obtusiusculis, posticis fere rectis; basi marginato, dorso antice leviter canaliculato. Scutello semicirculari, fortiter punctato. Elytris thorace paulo latioribus, parallelis, singulis ad apicem rotundatis testaceis, suturâ marginibusque piceis, superne subtiliter striato-punctatis, ad apicem lævibus. Antennis piceo-testaceis, articulis 3, 4, 5 subæqualibus, clavâ elongatâ. Tibiis anticis extus bidentatis; tarsis longis, præsertim posticis.

Long. 3¾ lin.; lat. 1⅘ lin.

Var. Elytris marginibus late piceis.

The following I have no doubt is the ♀ of this species, although the form is very different.

♀. Statura *Ph. horticolæ*, at brevior. Thorace canaliculâ impressâ utrinque foveolato. Elytris subtiliter striato-punctatis, interstitio suturali irregulariter punctulato.

Long. 4 lin.; lat. 2⅓ lin.

Variat; thorace nigro, vel testaceo maculis quatuor nigris. Elytris testaceis vel piceis.

Hab.—Nagasaki, in May.

Phyllopertha irregularis, sp. nov. (Pl. III. fig. 4.)

Ph. horticolæ affinis. Viridis (vel cuprea), breviter griseo-hirta. Capite thoraceque staturâ *Ph. horticolæ*, at hoc punctulato ut in *horticolâ* ♀. Scutello breviori, semicirculari, crebre punctato. Elytris paulo longioribus, parum convexis, testaceis, suturâ marginibusque æneis. Antennis piceis, clavâ prælongâ, nigrâ. ♂.

Long. 4½ lin.; lat. 2¼ lin.

Fœm.—Antennarum clavâ breviori, corpore crassiori, thorace crebre fortius punctato.

Var. Testacea; fronte, thoracis disco, scutelli lateribus viridibus.

From the above description it will be seen that this species differs from *Ph. horticola* besides the colouration in having the club of the antennæ much longer, the punctuation of the thorax is closer, and the elytra longer. Having only seen two specimens of this species I am not able to say what is the usual sculpture of the elytra. In the male above described they are not striated but are slightly rugulose, but in the female they are somewhat delicately punctured, the punctures forming lines near the suture. The club of the antennæ in the ♀ is as long as

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that in the ♂ of *Ph. horticola*. The clypeus, the sides of the thorax and the legs in the ♀ are obscure testaceous, but this is probably not always the case.

Hab.—Nagasaki (♂), in May; Kawachi (♀).

Phyllopertha orientalis, sp. nov.

Ph. campestri affinis. Obscure cupreo-ænea, elytris plerumque flavo-variegatis. Capite fere ut in *Ph. horticolâ*, fronte crebre punctulatâ, clypeo angulis rotundatis. Antennarum clavâ prælongâ nigrâ. Thorace parum convexo, antice angustato, sat crebre fortiter punctato, lateribus arcuatis, angulis posticis obtusiusculis, basi fere rotundato, marginato. Scutello arcuatim triangulari, punctulato. Elytris thoracis basi latitudinem æquantibus postice paulo ampliatis, ad apicem obtusis, depressiusculis, fortiter striatis, striis fortiter irregulariter punctatis, interstitiis convexis, subtiliter obsolete punctulatis.

Long. 4—5½ lin.; lat. 2½—3⅓ lin.

Var. a. Testacea, fronte thoracisque maculis duabus æneis; tarsis piceis.

Var. b. Testacea, fronte thoracis limbo, elytrorumque fasciis duabus irregularibus æneis.

Var. c. Ænea, elytris nigro-piceis, flavo-maculatis.

Besides the colouration this species varies much in form, the smaller specimens being more convex and slightly ovate; the sculpture of the elytra also varies, the interstices being almost rugulose in some specimens, whereas they are almost smooth in others.

Hab.—Kawachi; Nagasaki; Hakodadi. (Common in May and June.)

Phyllopertha arenaria, Brullé.

Hab.—Nagasaki, in May.

Phyllopertha octocostata, Burm.

Ph. octocostata, Burm. Handb. iv. 1, p. 243.

Hab.—Japan. "A common species; it appears with the first warm days of spring."

This is placed as a synonym of *Anomala costata*, Hope, under *Phyllopertha* in Gemminger's Catalogue; *costata* is quite a different insect, and will be referred to under *Anomala*, closely allied to *A. aurata*.

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Anomala rufocuprea, Motsch.

A. rufocuprea, Motsch. Etud. Ent. 1860, p. 14.
R. lucidulus, Motsch. Bull. Mosc. 1866, i. p. 171.

This species is very common, and is one of the most variable in appearance with which I am acquainted. It is closely allied to *A. Frischii*. It varies in colour from testaceous through cupreous-æneous, blue to nearly black.

Hab.—Japan; Tartary. "Abundant on sallows."

Rhombonyx lucidulus, Motsch. In the British Museum collection there is a specimen from Hokodadi which agrees perfectly with the description of this species. I consider it to be merely a variety of *A. rufocuprea* with testaceous elytra.

Anomala oblonga, Fabr. Motschulsky records this species from Japan. Has he not mistaken one of the varieties of *A. rufocuprea* for it? This latter has, however, the thorax constantly delicately punctured.

Anomala geniculata, Motsch.

Rhinoplia geniculata, Motsch. Bull. Mosc. 1866, i. p. 171.

"Statura et color *Anom. Frischii*, sed latior. Ovata, convexa, nitida, punctulata, supra pallide testacea; capite, thorace scutelloque plus minusve æneis, corpore subtus nigro-cupreo, pedibus nigro-æneis, geniculis testaceis; elytris dense punctato-striatis, interstitiis alternis paulo latioribus."

Long. 6 lin.; lat. 3½ lin.

Hab.—Japan.

If I have correctly determined this species, it is a broader and less convex species than *A. rufocuprea*, and has the thorax less densely punctured. I have seen specimens in which the elytra are æneous; but the margins are generally testaceous.

Length 6 to 8 lines.

Anomala costata, Hope.

A. costata, Hope, Proc. Zool. Soc. 1839, p. 73.

Hab.—Japan.

It is closely allied to *A. aurata*, Fabr., but has the channel on the thorax much stronger, and the costæ on the elytra more distinct, &c.

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Anomala testaceipes, Motsch.

Rhombonyx testaceipes, Motsch. Etud. Ent. 1860, p. 14.

" Oblongus, postice paulo dilatatus, punctatus, nitidus, supra viridi-æneus, subtus testaceus, nigro-viridi-variegatus; ore, antennis, thoracis lateribus angustissime, pygidio, ano pedibusque testaceis, tibiis tarsisque viridi-maculatis; capite crebre punctato; thorace valde transverso, nitido, sparsim punctulato, inæquali, medio longitudinaliter impresso, lateribus arcuatis, medio dilatatis antice angustatis, angulis anticis prominulis, posticis rectis; scutello transverso, arcuato, sparsim punctulato; elytris thorace paulo latioribus, postice dilatatis, apice subtruncatis, utrinque costis quatuor suturaque elevatis, costis obtusis, nitidis, interstitiis subrugoso-punctatis, paulo opacis; pygidio abdominisque punctatis."

Long. $6\frac{1}{2}$ lin.; lat. $3\frac{2}{3}$ lin.

I am in considerable doubt with regard to this species. There is, however, a specimen of an insect ($6\frac{1}{2}$ lin.) which agrees so nearly with the description that I have considered it the present species. There is also a common insect which I take to be merely a variety of *A. testaceipes*, which has the thorax rather less thickly punctured; the costæ of the elytra strongly marked, with the intervals semi-opaque, and very finely granulose. This is closely allied to *A. costata*, but is rather smaller (7 lin.), and is easily distinguished by the rugulose intervals of the elytra.

Hab.—Hakodadi; Nagasaki, &c., in July.

The following is also closely allied:—

Anomala flavilabris, sp. nov.

A. testaceipedi affinis, minus convexa, clypeo testaceo, thorace discrete punctulato, lateribus arcuatis in medio nec dilatatis, postice marginato; elytris obsolete costatis, interstitiis nitidis, punctatis et rugulosis.

Long. 7—8 lin.; lat. $3\frac{3}{4}$—4 lin.

This is at once separated from *A. testaceipes* (with the description of which it agrees perfectly except in the above particulars) by the sides of the thorax being not angulate in the middle, and by the base being margined, which is only the case towards the sides in *A. costata* and *testaceipes*.

Hab.—Japan.

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Anomala difficilis, sp. nov.

Elongata, convexa, nitida, supra testacea viridi tincta, fronte thoracisque disco viridi-æneis, pectore abdomineque nigro-æneis. Clypeo margine reflexo, subtilissime ruguloso, fronte discrete punctulatâ, oculis magnis. Thorace discrete subtiliter punctulato, antice capitis latitudine, postice paulo latiori; lateribus arcuatis medio paululo angulatis; angulis anticis prominulis, posticis rectis; basi marginato. Scutello parce subtiliter punctulato. Elytris thorace vix latioribus et triplo longioribus, postice paulo ampliatis, striatis, striis irregulariter impressis et punctulatis, interstitio juxta suturam parce punctato. Pedibus longis. Antennarum clavâ elongatâ.

Long. 6 lin.; lat. 3 lin.

Hab.—Japan.

Anomala pubicollis, sp. nov.

Breviter ovalis, convexa, cuprea, elytris testaceis, capite thorace corporeque subtus longe griseo-flavo pilosis. Capite: clypeo transverso, crebre subtiliter ruguloso, fronte minus crebre fortius punctulatâ. Thorace longitudine ¼ longiori, convexo, transversim sat fortiter punctato, antice angustato, angulis anticis obtusiusculis, lateribus arcuatis in medio paululo angulatis, angulis posticis fere rectis, basi ad scutellum leviter lobato. Scutello basi punctato. Elytris thorace vix latioribus et duplo longioribus, postice paulo ampliatis, ad apicem obtusis, convexiusculis, testaceis, obsolete subtiliter striato-punctatis, interstitio suturali obsolete punctato. Antennarum clavâ prælongâ.

Long. 4½ lin.; lat. 2⅔ lin.

Fœm.—Antennarum clavâ elongato-ovatâ; fronte crebre punctatâ; thorace crebre fortiter punctato.

Long. 5 lin.; lat. 3 lin.

Hab.—Nagasaki and Hiogo.

Euchlora cuprea, Hope.

E. cuprea, Hope, Proc. Zool. Soc. 1839, p. 72.

Hab.—Japan. "Appears in June, a fortnight later than *E. albopilosa*; both species do immense injury to foliage, and occur in the same localities in all the islands."

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Euchlora albopilosa, Hope.

E. albopilosa, Hope, Proc. Zool. Soc. 1839, p. 70.

Hab.—Japan.

Euchlora multistriata, Motsch.

Heteroplia multistriata, Motsch. Etud. Ent. 1861, p. 7.

Hab.—Japan; with the preceding, but not so common; Tsusima.

Mimela Gaschkevitchii, Motsch.

M. Gaschkevitchii, Motsch. Etud. Ent. 1857, p. 32.

Hab.—Japan; in all the islands; the red variety not so common. Hakodadi (black variety).

Mimela lucidula, Hope.

M. lucidula, Hope, Trans. Ent. Soc. i. 1835, p. 113.

Hab.—Japan (sec. Hope).

[*Mimela testaceoviridis*, Blanch.]

M. testaceoviridis, Bl. Cat. d. l. Coll. Ent. Mus. d. Paris, p. 197.

Hab.—China, Japan (sec. Jekel).

Popilia japonica, Newm.

P. japonica, Newm. Trans. Ent. Soc. iii. 1841, p. 43.

Hab.—Japan. Very common in all the islands. Kawachi, var. without æneous margin to elytra.

Popilia bisignata, Sturm., MS., given in Gemminger's Catalogue as a synonym of *P. cupricollis*, is probably this variety.

Adoretus tenuimaculatus, sp. nov.

Elongatus, leviter convexus, subnitidus, brunneus, dense breviter griseo-squamoso-pubescens. Capite magno, fronte crebre sat fortiter punctatâ, clypeo semicirculari, subtilius punctato, margine reflexo. Thorace capite paulo latiori, leviter convexo, crebre fortiter (latera versus confluente) punctato, transverso, longitudine duplo latiori, antice paululo angustiori, angulis anticis prominulis vix obtusis, lateribus leviter arcuatis, angulis posticis obtusiusculis.

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Elytris basi thoracis latitudine, medio paulo ampliatis, ad apicem obtusis, crebre fortiter punctatis, singulis costis tribus parum elevatis, secundâ serie maculorum parvorum albidorum ornatâ, ad apicem maculâ albidâ majore.

Long. 4⅔ lin.; lat. 2½ lin.

Hab.—Japan. Very common in all the islands.

DYNASTIDÆ.

Xylotrupes dichotomus, Linn.

Hab.—Phil. Is., China, Japan, Darjeeling.

Phileurus chinensis, Falderm.

Ph. chinensis, Fald. Mém. Ac. Petr. ii. 1835, p. 370.

Hab.—China; Japan.

CETONIIDÆ.

Rhomborrhina japonica, Hope.

R. japonica, Hope, Trans. Ent. Soc. iii. 1841, p. 64.

Hab.—Japan. Very common in all the islands.

Rhomborrhina unicolor, Motsch.

R. unicolor, Motsch., Etud. Ent. 1861, p. 8.

Hab.—Japan. Less common than the preceding, but associated with it.

Rhomborrhina polita, sp. nov.

Nigra, nitida. Capite angusto. Thorace antice angustato, lateribus discrete punctato. Scutello fere lævi. Elytris elongatis, apicem versus angustatis, subtilius discrete punctulatis. Tibiis posticis intus longe fulvo-hirtis.

Long. 13½ lin.

Allied to *R. japonica*, but much narrower. From *R. nigra* it is distinguished by its more elongate form, and less close punctuation. It most nearly resembles

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R. unicolor, but is much less closely punctured both on the thorax and elytra, the disk of the former being almost smooth as is also the scutellum; in *R. unicolor* the posterior tibiæ have scarcely any hair on the inner edge, whereas in the present insect there is a fringe of long fulvous hair in both sexes.

Hab.—Yokohama.

Glycyphana pilifera, Motsch.

G. pilifera, Motsch., Etud. Ent. 1860, p. 15.

Hab.—Japan, N. and S.

Glycyphana argyrosticta, Burm.

G. argyrosticta, Burm. Handb. iii. p. 360.
G. albosetosa, Motsch. Etud. Ent. 1861, p. 9.

Hab.—Japan, N. and S.

A black variety of this species occurs, but apparently only in the north.

Glycyphana Sieboldi, Snellen v. Voll.

G. Sieboldi, S. v. Voll., Tijdsch. Ent. Nederl. vii. 1864, p. 158.

Hab.—Japan.

Glycyphana fulvistemma, Motsch.

G. fulvistemma, Motsch. Schrenck, Reis. 1860, p. 135.

Hab.—Mongolia; Japan.

Cetonia submarmorea, Burm.

C. submarmorea, Burm. Handb. iii. p. 460.

Hab.—Japan.

Cetonia speculifera, Swartz.

C. speculifera, Swartz, Schönh. Syn. Ins. i. 3.

Hab.—China and Japan.

Anthracophora rusticola, Burm.

A. rusticola, Burm. Handb. iii. p. 624.

Hab.—Japan.

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Gnorimus subopacus, Motsch.

G. subopacus, Motsch., Schrenck, Reis. 1860, p. 134, t. 9, f. 5.

Hab.—Chowsan; Tsu-sima.

Trichius fasciatus, Linn.

Hab.—Yesso.

Trichius septemdecimguttatus, Snellen v. Voll.

(Pl. III. fig. 8.)

T. 17-guttatus, Snellen v. Voll., Tijdsch. Ent. Nederl. 1864, p. 159.

Niger, opacus; thorace elytrisque albo-maculatis.

Long. 5½ lin.; lat. 3 lin.

Var. Thorace elytrisque rubris, pedibus quatuor anticis piceis.

♂. Capite elongato, subtilissime granuloso. Thorace sat convexo, obsolete punctulato, longitudine ⅓ latiori, antice angustato, lateribus vix arcuatis, angulis posticis vix perspicuis; basi rotundato, marginato; superne maculis quinque parvis. Elytris convexiusculis, thorace paulo latioribus, medio rotundato-ampliatis, latitudine paulo longioribus, basi striatis, singulis maculis parvis albis, unâ juxta scutellum, alteris :·: positis. Pygidio utrinque maculâ magnâ albâ. Antennarum clavâ prælongâ. Pedibus longis.

♀. Clypeo paulo breviori; thorace crebre fortiter punctato. Elytris paulo latioribus. Antennarum clavâ elongatâ.

Hab.—Japan. "Four specimens only from Tomatru, near Nagasaki, in May. Sought during six years."

The red colouration is not a sexual character; and one of Mr. Lewis' specimens has the thorax red, with the anterior margin black.

Valgus angusticollis, sp. nov.

Statura *V. hemipteri*, thorace angustiori, elytris paulo longioribus.

Long. 2¾ lin.; lat. 1½ lin.

Closely allied to *V. hemipterus* and very similar in appearance. Thorax as in that species but relatively nar-

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rower, more narrowed in front, the sides nearly parallel behind the middle. Elytra a trifle longer than broad, with the sides parallel, striated as in *hemipterus*, with the interstices longitudinally scratched; on the second interstice, near the scutellum, there is commonly a spot formed of black scales, and another near the apex of the third interstice, with a white spot at the apex, but sometimes the black scales form a band at the base and another near the apex of the elytra, the space between the bands being sparsely clothed with whitish scales.

Penultimate segment of the abdomen with a white spot on each side above, the pygidium rarely with white scales. Tarsi in both sexes relatively longer than in *V. hemipterus*, the second joint being half the length of the basal joint.

Hab.—Japan. All the islands, including Tsu-sima; common.

DESCRIPTION OF PLATE III.

Fig. 1. *Ochodæus maculatus*, C. Waterh.
2. *Ectinohoplia variolosa*, C. W.
3. *Serica boops*, C. W.
4. *Phyllopertha irregularis*, ♂, C. W.
5. „ *diversa*, ♂, C. W.
6. *Pollaplonyx flavidus*, C. W.
7. *Granida albolineata*, Motsch.
8. *Trichius* 17-*guttatus*, Snellen v. Voll.

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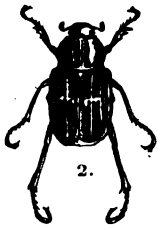

G.H.Ford.

Mintern Bros. imp

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VII. *Synopsis of British* Hemiptera-Heteroptera. By Edward Saunders, F.L.S. Part I.

[Read 5th April, 1875.]

The following pages have been prepared in order to give a short and concise monograph of our British *Hemiptera-Heteroptera*, and to show plainly, by means of analytical tables, the distinguishing characters of their genera and species. It may be thought that, whilst entomologists have such a book as Messrs. Douglas & Scott's "British Hemiptera," nothing further is needed; but since its publication many new species have been added and many corrections made; and the analytical tables here employed will, I believe, supply a want much felt by those who have studied Messrs. Douglas & Scott's work. In order to form these tables I have borrowed freely from Fieber, Mulsant and other continental authors; and I must remark that the characters here employed are only meant to distinguish our British genera and species apart, and may not always suffice to distinguish them from their European allies; but this book being meant for students of our British forms, I have thought it undesirable to use the more puzzling characters which are necessary to distinguish the European genera and species, although such a course would perhaps have been the more scientific. I have much pleasure here in thanking those who have kindly helped me with the loan of specimens, &c., and especially Messrs. Douglas & Scott and Dr. Power, and also Dr. Puton, for the ready way in which they have helped me whenever I have applied for their valuable assistance.

HEMIPTERA-HETEROPTERA.

I. Antennæ visible, legs not natatorial .. .. .. *Gymnocerata.*
II. Antennæ hidden, legs natatorial .. .. .. *Cryptocerata.*

GYMNOCERATA.

I. Elytra formed of several pieces joined together or reticulated .. .. *Geodromica.*
II. Elytra formed of one piece .. .. *Hydrodromica.*

N.B.—This last division contains those species only that run or leap on the surface of the water.

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GEODROMICA.

I. Scutellum attaining at least to the base of the membrane.
  A. Scutellum very nearly, or quite, covering the membrane .. .. *Tetyræ.*
  AA. Scutellum not nearly covering the membrane.
    a. Tibiæ spiny .. .. *Cydnidæ.*
    b. Tibiæ not spiny .. .. *Arthropteridæ.*
II. Scutellum not attaining to the base of the membrane.
  A. Elytra composed of corium, clavus and membrane.
  B. Joints of the tarsi three on all the legs.
  C. Rostrum four-jointed.
  D. Antennæ filiform at the apex .. .. .. *Nabidæ.*
  DD. Antennæ more or less thickened at the apex.
  E. Ocelli wanting .. .. *Pyrrhocoridæ.*
  EE. Ocelli present.
  F. Antennæ above the line of the eyes.
    a. Species very elongate, with very long delicate legs .. .. *Berytidæ.*
    b. Species without very long delicate legs .. *Coreidæ.*
  FF. Antennæ below the line of the eyes. .. .. *Lygæidæ.*
  CC. Rostrum three-jointed.
  D. Ocelli present.
  E. Membrane in one piece with the rest of the elytra .. .. *Ceratocombidæ.*
  EE. Membrane distinct.
    a. Rostrum long, antennæ more or less thickened at the apex .. .. .. *Saldidæ.*
    b. Rostrum short, antennæ filiform at the apex .. .. *Reduvidæ.*
  DD. Ocelli wanting. .. .. *Acanthidæ.*
  BB. Joints of the tarsi two on the front legs.
    a. Second joint of antennæ much longer than the other three put together .. .. *Tingididæ.*
    b. Second joint of antennæ of normal length *Aradidæ.*
  AA. Elytra composed of corium, clavus, cuneus and membrane .. .. *Phytocoridæ.*
AAA. Elytra composed of corium, clavus, embolium, cuneus and membrane.
  B. Rostrum three-jointed .. .. *Anthocoridæ.*
  BB. Rostrum four-jointed .. .. *Microphysidæ.*

TETYRÆ.

I. Entire insect hairy .. .. *Odontoscelis.*
II. Insect not hairy.
  A. Legs with long spines .. .. *Corimelæna.*
  AA. Legs without spines, or with very short ones.
    a. Front angles of thorax without processes *Eurygaster.*
    b. Front angles of thorax with processes .. *Podops.*

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Corimelæna.

1. ***scarabæoides,*** Linn. Fig. Dougl. & Scott, Brit. Hem. pl. ii. fig. 2.

Short, oval, dark bronzy, closely punctured; legs black, tarsi and antennæ piceous.

Length 1½ line.

Moss, dead leaves, &c.

Odontoscelis.

1. ***fuliginosus,*** Linn. Fig. Dougl. & Scott, Brit. Hem. pl. ii. fig. 3.

Insect hairy; head and thorax more or less dark, the base of the latter often pale, disk with a white median line; elytra of a dirty ochreous colour, with black markings and with a narrow, pale dorsal line; thorax and elytra sometimes nearly black, with the dorsal line, and a longitudinal stripe from each shoulder, pale.

Length 3—3½ lines.

Sandhills, Deal; not rare.

Eurygaster.

1. Sides of thorax straight .. .. ***maurus.***
2. Sides of thorax rounded .. .. ***niger.***

1. ***maurus,*** Linn. Fig. Dougl. & Scott, Brit. Hem. pl. ii. fig. 5.

Colour variable, sometimes pale greyish-brown all over; at other times dirty ochre colour, with darker markings; connexivum spotted with dark brown; surface punctured with darker punctures; scutellum with a white tubercle on each side of the base; central lobe of the face extending to the anterior margin of the head.

Length 5 lines.

By sweeping, &c.; not uncommon.

2. ***niger,*** Fab. Fig. Panz. Faun. Germ. cxi. 7.

Flatter than the preceding; pale or dark ochreous-brown; connexivum not spotted; scutellum much longer and narrower than in *E. maurus,* and without white tubercles at the base; central lobe of the face not extending to the anterior margin of the head.

Length 6 lines.

Rare; sandhills, Deal.

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Podops.

1. *inunctus*, Fab. Fig. Dougl. & Scott, Brit. Hem. ii. fig. 8.

Of a dirty brown colour, with dark punctures; head slightly darker than the rest of the body; thorax with a triangular-shaped process at each anterior angle; scutellum with a pale tubercle on each side at the base.

Length 3 lines.

Moss, roots of grass, &c.; not uncommon.

CYDNIDÆ.

I. Head and thorax with long scattered hairs, clypeus not notched .. .. *Geotomus.*

II. Head and thorax not hairy, clypeus more or less notched .. .. *Sehirus.*

Geotomus.

1. *punctulatus*, Costa. Fig. Costa, Cent. II. dec. 6, pl. v.

Dark pitchy-brown, almost black, except immature specimens, which are testaceous. Thorax posteriorly, scutellum and elytra, closely punctured; membrane dusky, pale at the base; head and thorax with long projecting hairs round their margins.

Length 2 lines.

White Sand Bay, Cornwall; under stones and *Erodium*.

Sehirus.

1. Entirely black .. .. *morio.*
2. With white margin and white spots on the elytra.
   a. A small white spot on the disk of each elytron.. *biguttatus.*
   b. A large white spot on the shoulder and a second above the membrane .. .. *bicolor.*
3. Margins only white.
   a. About 4 lines long, steel-blue .. .. .. *dubius.*
   b. About 2 lines long, blue-black .. .. .. *albomarginatus.*

1. *bicolor*, Linn. Fig. Panz. Faun. Germ. 32, 11.

Black, with a bluish tinge; a spot on each side of the thorax in front, a large spot on each shoulder somewhat of a kidney-shape, and a spot at the apex of the corium white; membrane pale; tibiæ white externally on their basal half.

Length 3—3½ lines.

Common in sandpits and by sweeping.

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2. ***dubius***, Scop. Fig. Curtis, Brit. Ent. ii. 74.
Bright purplish-blue; sides of the thorax and elytra narrowly pale; connexivum posteriorly white, spotted with black. Surface punctured.
Length 3½—4 lines.
Rare. Isle of Wight; Portland; Pangbourne.

3. ***biguttatus***, Linn. Fig. Panz. Faun. Germ. 32, 13.
Black; sides of the thorax and elytra and a spot on the disk of each elytron white. Thorax very coarsely and remotely punctured.
Length 3—3½ lines.
Not common. London district.

4. ***morio***, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. ii. fig. 1.
Entirely black except the tarsi and the base of the antennæ; surface closely punctured.
Length 3½—5 lines.
London district. Not common.

5. ***albomarginatus***, Fab. Fig. Panz. Faun. Germ. 33, 20.
Much smaller and more convex than any of the preceding. Black, rugosely punctured, margins of the elytra white.
Length 2 lines.
Common at the roots of grass in dry places.

ARTHROPTERIDÆ, Fieb.

I. Sides of thorax foliaceous .. .. *Sciocoris.*
II. Sides of thorax not foliaceous.
A. Nose deflected, somewhat pointed.
a. Nose very elongate, narrowly pointed .. *Ælia.*
b. Nose short, widely pointed .. .. *Æliodes.*
AA. Nose horizontal, short, generally bilobate.
B. Joints of tarsi three.
C. Second segment of abdomen without a process.
D. Very short and robust, elytra at the base wider than long .. .. *Eysarcoris.*
DD. Not very short and robust, elytra at the base not wider than long.
E. Sides of thorax in front rugose or roughly toothed.
F. Front thighs toothed beneath .. .. *Picromerus.*

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FF. Front thighs not toothed.
  a. Apical joint of antennæ shorter than fourth .. .. *Podisus.*
  b. Apical joint of antennæ longer than fourth .. .. *Rhacognathus.*
EE. Sides of thorax not rugose or rugosely toothed in front.
  F. Front thighs toothed beneath.. .. .. *Jalla.*
  FF. Front thighs not toothed.
    G. Margins of thorax not sharply defined, species bright blue .. .. *Zicrona.*
    GG. Margins of thorax sharply defined, generally reflexed
      a. Margins of head reflexed, species small and bright .. .. *Strachia.*
      b. Margins of head not reflexed, species not small and bright.. .. .. .. *Pentatoma.*
  CC. Second segment of abdomen with a process.
    a. Process very short and blunt, posterior angles of thorax much produced .. *Tropicoris.*
    b. Process elongate, posterior angles of thorax not produced .. .. .. *Piezodorus.*
BB. Joints of tarsi two .. .. *Acanthosoma.*

Sciocoris.

1. *terreus*, Schrk. Fig. Dougl. & Scott, Brit. Hem. pl. ii. fig. 4.

Obscure dirty ochreous colour, with darker brown markings; punctuation dark and rather dense; front margin of the thorax deeply incised. Membrane not reaching to the apex of the body. Connexivum spotted with brown.

Length 2½ lines.

Sandhills, Deal; not uncommonly.

Ælia.

1. *acuminata*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. ii. fig. 6.

Ochreous; centre of the head and thorax with a brownish stripe, widest at the base of the thorax, narrowest at the apex of the head, darkest at the margins, in the middle of which is a narrow, pale, slightly raised line; near each lateral margin is another darker line, the margins themselves pale. Scutellum with a pale line down the centre and a rudimentary one on each side; entire insect strongly punctured; sides of the thorax and head in the same lines.

Length 4 lines.

Occasionally by sweeping, &c.

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ÆLIOIDES.

1. *inflexus*, Wolff. Fig. Dougl. & Scott, Brit. Hem. pl. ii. fig. 7.

Pale brownish-ochre colour, largely and darkly punctured. Head rather darker than the rest of the body; lateral margins and dorsal line of the thorax narrowly pale; anterior angles with a very slight lateral process; base of the scutellum with a paler spot at each extremity.

Length 2⅓ lines.

By sweeping, &c.

EYSARCORIS.

1. Scutellum with a bronzy patch at the base .. *melanocephalus.*
2. Scutellum without any bronzy patch and with a small white speck on each side .. .. *æneus.*

1. *melanocephalus*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. ii. fig. 9.

Head, front of thorax and scutellum bright coppery-bronze or bronzy-black colour, the rest of the insect pale, largely and darkly punctured; connexivum flavous, spotted with black.

Length 2½ lines.

New Forest and Darenth Wood.

2. *æneus*, Scop. Fig. (*perlatum*) Hahn, Wanz. Ins. ii. p. li. fig. 155.

Pale ochreous-brown; head bronzy-green; thorax bronzy-black on each side near the anterior margin; surface largely and darkly punctured. Scutellum same colour as the elytra, with a raised white tubercle on each side of the base; posterior angles of the thorax much produced.

Length 2⅓ lines.

New Forest.

ZICRONA.

1. *cærulea*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. iii. fig. 3.

Bright blue or blue-green, shining, punctured; legs and antennæ black.

Length 2¾—3½ lines.

London district; and among heather, Scarborough.

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Jalla.

1. *dumosa*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. iii. fig. 4.

Head, antennæ, front of thorax, scutellum and legs black, the rest brownish. A stripe down the centre of the head, side margins and dorsal line of the thorax in front, dorsal line of the scutellum and a spot on each side, and a ring round each tibia, red. Whole insect largely punctured.

Length 6 lines.

Very rare, eastern coasts. In larva state, Deal, July, 1868.

Rhacognathus.

1. *punctatus*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. iii. fig. 5.

Luteous-brown, closely and deeply punctured with black punctures. Head, sides of the thorax, and sometimes the scutellum and elytra, more or less bronzy, or bronzy-green. Dorsal line of thorax pale, a spot on each segment of the connexivum, and a ring on each tibia, red. Antennæ black, base of 3rd joint narrowly pale. Beneath pale, variegated with black, or entirely bronzy-green.

Length 4 lines.

Not common.

Podisus.

1. *luridus*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. iii. fig. 6.

Yellowish-brown, closely punctured with bronzy punctures. Head, sides of thorax and connexivum bronzy-green, the latter with red transverse spots; sides of the thorax roughly and unevenly denticulate in front, posterior angles much produced. Antennæ black, apex of 4th joint widely red. Legs pale, spotted with black.

Length 5 lines.

Not common.

Strachia.

1. Bright red, with black markings .. .. .. *festiva.*
2. Green or blue, with yellow or red markings .. .. *oleracea.*

1. *festiva*, Linn. Fig. Panz. Faun. Germ. vi. 19.

Vermilion red. Head, three spots on each side of the thorax, a large triangular spot at the base of the scutel-

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lum, clavus, claval suture of corium, a large spot extending from the claval suture nearly to the lateral margin, a small round spot below it, and the membrane, black; beneath red with black spots.

Length 3½—4 lines.

Not common; found on flowers.

2. *oleracea*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. iii. fig. 2.

Bright olive-green, punctured, front margin of the head, lateral margins of the thorax and dorsal line, apex of scutellum, and a spot on the corium on each side of it, an elongate spot behind the shoulder, a spot on each segment of the connexivum, apex of femora, and a ring on each tibia, white or red; beneath olive-green.

Length 3½—4 lines.

On flowers, &c., by sweeping.

Pentatoma.

I. Angles of thorax produced and pointed .. .. *baccarum.*

II. Angles of thorax not produced.

A. Species brown.

1. Legs hairy .. .. *verbasci.*
2. Legs not hairy .. .. *vernale.*

AA. Species green.

1. Sides of thorax and apex of scutellum concolorous .. .. *viridissima.*
2. Sides of thorax and apex of scutellum pale .. .. *juniperinum.*

1. *baccarum*, Linn. Fig. Panz. Faun. Germ. 113—9 (*nigricorne*) (colour too dull) = *nigricorne*, Dougl. & Scott.

Ochreous, covered with black punctures. Scutellum and thorax transversely rugose. Apex of head, sides of thorax, tibiæ and corium of a more or less orange-red. Antennæ, sides of the head, and the very prominent sharp posterior angles of the thorax, black. Connexivum with dusky spots; beneath ochreous.

Length 6 lines.

Very rare; Devonshire.

2. *verbasci*, Linn. Fig. (*baccarum*) Panz. Faun. Germ. 33, 20.

Luteous-brown, closely punctured with black punctures. Legs and underside with long hairs, the hairs projecting in places round the sides. Scutellum with the apex pale.

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Connexivum spotted with black. Antennæ: first joint pale, the rest black, narrowly pale at their bases.

Length 6 lines.

Common by sweeping, &c.

3. *vernale*, Wolff. Fig. Panz. Faun. Germ. 113—6.

Greenish-brown; closely punctured with black punctures. Legs and underside very shortly pubescent; sides of the thorax and apex of scutellum narrowly pale. Connexivum scarcely projecting beyond the elytra; black, with narrow, pale, transverse spots. Antennæ: first three joints pale; fourth and fifth black at the apex.

Length 4½ lines.

Very rare; Weston-super-Mare.

4. *juniperinum*, Linn. Fig. Panz. Faun. Germ. 33, 14.

Green, rather dark; sides of the thorax and the apex of the scutellum pale. Elytra narrowly pale behind the shoulders. Connexivum scarcely visible. Surface densely punctured. Scutellum and thorax in front transversely rugose. Antennæ black at the apex; legs the same colour as the body.

Length 5½ lines.

Junipers; Mickleham, Caterham, &c.

5. *viridissima*, Poda. Fig. (*dissimile*) Dougl. & Scott, Brit. Hem. pl. iii. fig. 1.

Paler green than the last; flatter. Connexivum projecting considerably. Body above entirely green; the apex of the scutellum alone slightly paler. Beneath: legs and antennæ pale; apical joint of the latter and a band on the fourth nearly black.

Length 5½—6 lines.

Not uncommon, by sweeping, &c.

Piezodorus.

1. *lituratus*, Fab. Fig. (*purpureipennis*) Dougl. & Scott, Brit. Hem. pl. iii. fig. 9.

Green; base of the thorax, clavus and corium, except the exterior margin, often red or purplish. Antennæ reddish. Beneath pale green. Surface regularly punctured with round black punctures; posterior angles of the thorax obtuse, not produced. Connexivum pale. Abdomen above black.

Length 5½—6 lines.

Common, by sweeping, &c., especially on furze.

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Acanthosoma.

I. Hind angles of thorax not produced and pointed.
  A. Connexivum spotted with black .. .. *griseum.*
  AA. Connexivum not spotted with black.
    a. Membrane extending much beyond the apex of the body .. .. *dentatum.*
    b. Membrane extending very little beyond the apex of the body .. .. .. *tristriatum.*
II. Hind angles of thorax produced and pointed .. *hæmorrhoidale.*

1. *griseum*, Lin. Fig. (*agathinum*) Panz. Faun. Germ. 114, 10, 11.

Ochreous or reddish-ochreous. Connexivum pale, with black spots; beneath pale. Surface very largely and irregularly punctured with black. Scutellum generally with a dark spot at the base. Connexivum sometimes red at the apex.

Length 3½—4 lines.

Common on birches.

2. *dentatum*, De Geer. Fig. Panz. Faun. Germ, 115, 13, 14 (too highly coloured).

Dirty yellowish-green; base of the thorax, clavus and corium internally red; beneath and legs yellowish; apex of body blood-red. Connexivum very narrow, pale. Antennæ pale at the base, apical half dark. Surface roundly punctured with black all over.

Length 4 lines.

Not uncommon on birches.

3. *tristriatum*, Fab. Fig. (*pictum*) Dougl. & Scott, Brit. Hem. pl. iv. fig. 2.

Bright pale green. Elytra with the clavus and the corium, within the nerve, blood-red; hind angles of the thorax and the extreme apex of the connexivum of the same colour. Apex of the scutellum and a spot at each basal angle pale. Thorax roughly punctured in front, rather finely behind. Elytra finely, scutellum largely punctured; punctures not black.

Length 4 lines.

On junipers; local; Boxhill, &c.

4. *hæmorrhoidale*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. iv. fig. 1.

Of a lurid ochreous colour, or greenish; much larger than any of the preceding. Thorax strongly angulated at the sides; angles more or less red, with the apex black;

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punctuation of the surface close, irregular and black. Scutellum with large remote punctures. Elytra very densely punctured, generally of a browner tint than the scutellum. Beneath ochreous, apex red.

Length 7 lines.

On birches in the autumn.

Picromerus.

1. *bidens*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. ii. fig. 7.

Brown, apex of scutellum narrowly pale; connexivum obscurely spotted with red; legs and antennæ orange-red; beneath dull red, punctured with brown; surface deeply punctured; scutellum transversely rugose; each posterior angle of the thorax produced into a sharp spine; sides anteriorly roughly denticulate.

Length 5½ lines.

Not uncommon.

Tropicoris.

1. *rufipes*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. iii. fig. 8.

Bronzy-brown; antennæ and legs red, the apex of the former brown; beneath red, punctured with black; apex of scutellum red; connexivum with green metallic spots; anterior angles of the thorax acute; posterior angles much produced, rounded, with a short, sharp point posteriorly; surface deeply and closely punctured with darker brown.

Length 7 lines.

Common on trees, &c.

COREIDÆ.

I. Apical joint of antennæ never much longer, generally much shorter than third.
  A. Body not elongate, and linear.
  B. Head without processes or spines outside the antennæ (*i. e.* between them and the eyes).
  C. Head not spinous between the antennæ .. *Gonocerus.*
  CC. Head spinous between the antennæ.
    a. Head with one spine .. .. .. *Verlusia.*
    b. Head with two spines .. .. .. *Syromastes.*
  BB. Head with processes or spines outside the antennæ, as well as sometimes between them.
  C. Sides of thorax much raised and reflexed posteriorly .. .. *Coreus.*

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CC. Sides of thorax not much raised and reflexed posteriorly.
D. Second joint of antennæ much shorter than third.
E. Hind thighs not spined.
a. Antennæ not very rugose; second joint about half as long as third .. .. *Atractus.*
b. Antennæ very rugose; 2nd joint not one fourth so long as the third .. .. *Pseudophlæus.*
EE. Hind thighs spined beneath .. .. .. *Bathysolen.*
DD. Second and third joints of antennæ subequal.
E. Hind thighs spined beneath.
a. Entire insect covered with long projecting hairs .. .. *Dasycoris.*
b. Insect without projecting hairs .. .. *Ceraleptus.*
EE. Hind thighs not spined.
a. Bright red, with black spots .. .. *Therapha.*
b. Dull ochreous-brown, or flavous .. .. *Corizus.*
AA. Body elongate, and linear.
a. Basal joint of tarsi about as long as the other two together .. .. .. *Myrmus.*
b. Basal joint of tarsi twice as long as the other two together .. .. .. *Chorosoma.*
II. Apical joint of antennæ much longer than third.
a. Posterior thighs spined beneath .. .. *Alydus.*
b. Posterior thighs not spined .. .. .. *Stenocephalus.*

Gonocerus.

1. *venator,* Fab. Fig. Dougl. & Scott, Brit. Hem. pl. iv. fig. 5.

Reddish-brown; legs slightly paler; terminal joint of antennæ and apex of third joint sometimes darker. Surface regularly punctured with black; thorax much raised posteriorly and produced on each side to a somewhat sharp angle. Connexivum with a paler band on each segment.

Length 6 lines.

On box trees, Boxhill.

Verlusia.

1. *rhombea,* Linn. Fig. Dougl. & Scott, Brit. Hem. pl. iv. fig. 6.

Ochreous-brown; second and third joints of antennæ reddish, apical joint dark. Entire insect punctured with black; sides of thorax narrowly pale, produced posteriorly in an obtuse angle just above the base. Connexivum

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much produced on each side and sharply angulated in the middle.

Length 5 lines.

Not rare.

COREUS.

1. *scapha*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. iv. fig. 4.

Dark brown, rugosely punctured with black. Head on each side with a spine outside the antenna; sides of the head in front of the eyes parallel, narrowly pale. Thorax concave, with a sharp projecting angle at each side in front. Sides narrowly pale in front, much raised, dilated and rounded posteriorly; sides of the elytra slightly rounded. Connexivum with a small, external, transverse, pale spot on each segment. Beneath ochreous, punctured with black.

Length 5½—6 lines.

Local, but not rare on *Ononis*, &c.; usually on the coast.

SYROMASTES.

1. *marginatus*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. iv. fig. 3.

Brown, rugosely and regularly punctured with black. Head with two converging rugose spines between the eyes. Thorax very wide behind, and its sides broadly angulated posteriorly, anterior margin the same width as the head. Elytra subparallel; connexivum much produced, its sides rounded; each segment with a paler round spot inwardly. Beneath with a pale round spot on the side of each abdominal segment.

Length 6—6½ lines.

Common by sweeping, &c.

ATRACTUS.

1. *Dalmanii*, Schill. Fig. Dougl. & Scott, Brit. Hem. pl. iv. fig. 8.

Chocolate-brown, head with numerous tubercles. Thorax rugose, with the sides in front pale, and with two longitudinal rugosities on the disk. Scutellum impressed, with a central keel and a velvety spot on each side of it. Elytra rugose; connexivum regularly rounded.

Length 3 lines.

Weybridge; Reigate; in sandy places.

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PSEUDOPHLŒUS.

1. ***Fallenii***, Schill. Fig. Dougl. & Scott, Brit. Hem. pl. iv. fig. 9.

Pale ochreous or brown. Head and thorax rugose, the latter with two elevated longitudinal ridges, sides emarginate, irregularly spined, especially in front. Scutellum with a pale central keel. Elytra very largely punctured in lines. Connexivum transversely banded with darker brown; beneath varied with brown.

Length 3—3½ lines.

Under *Erodium;* common at Deal and elsewhere.

BATHYSOLEN.

1. ***nubilus***, Fall. Fig. Hahn, Wanz. Ins. fig. 191.

Shorter and stouter than the preceding. Dark brown, head and thorax rugose, sides of the latter reflexed, irregularly dentate; disk flat, without longitudinal ridges. Elytra punctured and finely granulated, posterior thighs with two small spines beneath.

Length 3 lines.

Very rare; Deal.

DASYCORIS.

1. ***hirticornis***, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. iv. fig. 7.

Chocolate-brown. Entire insect more or less hairy. Lateral margins of thorax very narrowly white, with long white teeth. Connexivum with lighter transverse bars. Hind thighs with several teeth.

Length 5 lines.

Not uncommon by sweeping, &c.

CERALEPTUS.

1. ***lividus***, Stein. Fig. Dougl. & Scott, Brit. Hem. pl. vi. fig. 1 (*squalidus*).

Pale ochreous-brown. Second joint of antennæ and part of third red, apex darker; thorax rugose, sides and base dark; elytra finely and regularly rugose, lateral margins in front pale; connexivum elevated, regularly rounded, with a pale band at each segment; beneath and legs ochreous; hind femora dark at the apex and toothed.

Length 5 lines.

Rare; Deal.

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THERAPHA.

1. *hyoscyami*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. v. fig. 2.

Bright red. Sides and back of head, a band across the front of thorax and a spot on each side of its base, base of scutellum, clavus, and a spot on each elytron, legs and antennæ, black; beneath red, with a row of black spots on each side. Entire insect slightly hairy and punctured.

Length 4½ lines.

Not uncommon in the South-West of England, by sweeping.

CORIZUS.

I. Upper surface of abdomen black, with pale spots.
  A. 4th abdominal segment above angularly cut out in the centre posteriorly.
    1. 5th abdominal segment with two converging yellow lines, forming an inverted V; apical segment black, with two pale longitudinal stripes .. .. .. *crassicornis.*
    2. 5th abdominal segment with two parallel yellow lines; apical segment white, with a dark central line .. .. .. *abutilon.*
  AA. 4th abdominal segment not angularly incised posteriorly, although somewhat emarginate.
    1. Tibiæ barred and spotted with black .. *parumpunctatus.*
    2. Tibiæ not barred or spotted .. .. *capitatus.*
II. Upper surface of abdomen yellow, with black spots.. *maculatus.*

1. *crassicornis*, Linn. Fig. Pans. Faun. Germ. 92, 18.

Dark greyish-brown. Thorax deeply punctured, with the lateral margins and a narrow dorsal line slightly raised and paler; corium somewhat transparent, the nerves sometimes spotted with black; connexivum flavous, barred with black; abdomen beneath pale, above black, with a Λ-shaped spot on the 4th and 5th segments, and a longitudinal line on each side of the apical segments, flavous.

Length 3½ lines.

Rare; Charlwood, Surrey, by sweeping in the autumn, several specimens; also at Dorsetshire (Dale).

2. *abutilon*, Rossi.

Pale ochreous, sometimes darker. Connexivum pale, with a black spot on each segment; abdomen above with its apical segment pale, except a dark line down its middle.

Length 4 lines.

Deal and Bournemouth.

A stouter and paler insect than the preceding, but I much doubt its being really distinct. I have a long series

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of both species from abroad, containing specimens which it would be very difficult satisfactorily to determine under which name they should be placed. The markings on the abdomen seem to be very variable.

3. *maculatus*, Fieb. Fig. H.-Scff. Wanz. Ins. fig. 559.

Orange-yellow. Thorax very deeply punctured, dorsal line narrowly raised; nerves of the corium spotted with black; connexivum spotted with black. Abdomen above orange-yellow, with black spots at the sides and a black line down the middle of the apical segment; hind thighs not thickened.

Length 4 lines.

New Forest.

The uniform colour and the orange upper surface of the abdomen at once distinguish this species.

4. *capitatus*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. v. fig. 3.

Head, thorax and scutellum dark orange-coloured, the latter with its apex whitish; corium transparent in front, orange-red near the apex, nerves spotted with black. Connexivum barred alternately with dark brown and ochreous. Upper surface of abdomen black, with some yellow spots near the base; the apical segment pale, with the centre black. Tibiæ pale, with irregular brown rings.

Length 3½ lines.

Occasionally by sweeping.

5. *parumpunctatus*, Schill. Fig. Panz. Faun. Germ. 117, 10.

Ochreous-brown, occasionally with a reddish tinge. Thorax punctured. Nerves of the corium reddish. Connexivum pale, sometimes with small round black spots. Abdomen above black, with an elongate spot on the 3rd and 4th segments, two small ones on the 5th, and a line on each side of the centre of the apical one, yellow.

Length 3½ lines.

Occasionally by sweeping; abundantly at the roadside near Bournemouth.

Myrmus.

1. *miriformis*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. v. fig. 4.

Elongate, depressed. Head and thorax brown or greenish-brown, the sides of the latter paler. Elytra

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brownish, the margins pale green. Antennæ covered with bristly hairs; legs pale.

Length 5 lines.

Not uncommon on heaths by sweeping.

A variable species in colour, and often found with the elytra undeveloped.

Chorosoma.

1. *Schillingi*, Schml. Fig. Dougl. & Scott, Brit. Hem. pl. v. fig. 5.

Linear, very elongate, pale ochreous; elytra not reaching to the apex of the abdomen. Abdomen above with a dark stripe down each side, which does not reach the apex. Apex of posterior tibiæ and all the tarsi brown.

Length 6—8 lines.

Deal and Lowestoft; by sweeping.

Alydus.

1. *calcaratus*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. v. fig. 7.

Elongate, black, hairy; first three joints of antennæ partly pale. Thorax flat on the disk, wider at the base than the elytra. Scutellum with its extreme apex pale. Connexivum with yellowish-white spots. Legs and tibiæ yellowish, base and apex darker. Tarsi: first joint at base yellow, rest black; posterior thighs with several spines.

Length 5½ lines.

Not rare in autumn, on *Sarothamnus* and *Ononis*.

Stenocephalus.

I. 2nd joint of antennæ with a black central band .. .. *agilis*.
II. 2nd joint of antennæ entirely pale.. .. .. .. *neglectus*.

1. *agilis*, Scop. Fig. Dougl. & Scott, Brit. Hem. pl. v. fig. 6.

Brown, punctured. Antennæ: first joint brown, 2, 3 and 4 flavous, with the apex of each and a ring in the middle of the 2nd brown. Thorax with nearly straight sides, much wider behind than in front. Scutellum with the extreme apex white. Elytra with a small whitish spot on each just above the membrane. Connexivum yellow, barred with black; legs yellow; apex of thighs of two

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hind pairs and whole of front thighs, apex of all the tibiæ, and the tarsi, brown. Beneath brown.

Length 6 lines.

Not uncommon; in profusion near Dawlish in Sept. 1871.

2. ***neglectus***, H.-Scff. Fig. H.-Scff. Wanz. Ins. iii. fig. 272.

Extremely like the preceding, but narrower and more parallel; 2nd joint of antennæ without a band in the middle.

Length 6 lines.

Rare; coast of Devonshire.

Although this is generally admitted as a species, I can hardly believe it to be distinct.

BERYTIDÆ.

I. Forehead not produced between the antennæ into a long narrow point.
   a. Apical joint of antennæ as long as the 2nd joint or nearly so .. .. *Metatropis.*
   b. Apical joint of antennæ not nearly so long as the 2nd .. .. *Metacanthus.*

II. Forehead produced between the antennæ into a long narrow point.
   a. 2nd joint of antennæ not so long as the apical club .. .. *Berytus.*
   b. 2nd joint of antennæ much longer than apical club .. .. *Neides.*

METATROPIS.

1. ***rufescens***, H.-Scff. Fig. Dougl. & Scott, Brit. Hem. pl. v. fig. 2.

Rufescent, punctured. Thorax much raised posteriorly, with the sides and dorsal line strongly carinated. Legs and antennæ very long and fine, paler than the body, subtransparent, irregularly spotted with brown and with a wide brown band just below the apex of each femur. Antennæ with its apical joints, and a band near the apex of the 1st joint, brown.

Length 4 lines.

Rare; Southsea; Pangbourn.

METACANTHUS.

1. ***punctipes***, Germ. Fig. Dougl. & Scott, Brit. Hem. pl. 5, fig. 8.

Pale ochreous. Head black. Thorax with a band in

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front and the hind angles black, and with a brown tubercle just above the scutellum. Scutellum with an elongate curved spine at its base. Membrane very large and hyaline. Legs and antennæ very thin and long, banded with brown. Apical joints of latter black.

Length 2—2½ lines.

Common on *Ononis*.

Berytus.

I. Membrane as wide or wider than the corium.
  A. Apex of 1st joint of antennæ not black, although darkened.
    a. Membrane largely rounded .. .. *montivagus*.
    b. Membrane narrowly rounded .. .. *pygmæus*.
  AA. Apex of 1st joint of antennæ black .. .. *cognatus*.
II. Membrane narrower than the corium.
  A. Club of 1st joint of antennæ scarcely darkened *clavipes*.
  AA. Club of 1st joint of antennæ black, or nearly so.
    a. Thighs much thickened and black at the apex .. .. *crassipes*.
    b. Thighs not much thickened, dusky at apex *minor*.

1. *montivagus*, May.

Elongate, ochreous, widest at the membrane, which is irregularly and clearly marked with dark brown. Thorax punctured, finely in front, coarsely behind, with the sides and dorsal line strongly carinated. The lateral carinæ are not so strong as in the other species. Apex of corium black. Antennæ and legs long, the apex of 1st joint of the former thickened and brown; apex of the others brown; terminal joint black, club-shaped and hairy.

Length 3—3½ lines.

Not uncommon in moss, &c.

2. *pygmæus*, Reut.

Signoreti, Dougl. & Scott.

Elongate, ochreous, membrane not wider than the corium across the middle, but very nearly of the same width. Process between the eyes produced and pointed in front. Thorax narrower than in the preceding, very flat from a sideways view, with the dorsal line and sides carinated; apex of corium brown; membrane with very slight brown markings; club of the 1st joint of antennæ hardly darkened; knees pale.

Length 2½ lines.

In moss; widely distributed, but not common.

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3. ***cognatus***, Fieb.

Larger than the preceding, and distinguished at once from it and *montivagus* by the black club to the 1st joint of antennæ. Frontal process shorter and less attenuate. Thorax wider behind and more raised. Apex of the thighs slightly more thickened and somewhat darkened. Membrane with distinct brown markings.

Length 3 lines.

In moss, &c.; Reigate, Dartford, &c., &c.

4. ***clavipes***, Fieb. Fig. Hahn, Wanz. Ins. i. fig. 69.

Very elongate and narrow, ochreous; membrane much narrower than the corium. Frontal process much produced and attenuate. Club of 1st joint of antennæ slightly darkened; apical joint black. Thorax tricarinate; the carinæ subparallel; extreme apex of corium brown; legs very long; knees scarcely darkened. Can only be confounded with *minor*, from which it is easily separated by its larger size, longer thorax, narrower membrane, longer legs and much produced frontal process.

Length 3 lines.

In moss; not common.

5. ***crassipes***, H.-Scff. Fig. Fieb. Beitr. i. t. ii. fig. 28.

Short and somewhat stout for a member of this genus, ochreous, frontal process not much produced. Thorax tricarinate; apex of corium brown-black; membrane clouded with brown. Apex of 1st joint of antennæ strongly clubbed, black; also apices of 2nd and 3rd joints and the whole of the apical joint black. Knees much thickened, widely black.

Easily separated from all the other species by the short thick form, and the thick black knees.

Length 2—2⅛ lines.

Moss; Mickleham, Bexley, &c.; rare.

6. ***minor***, H.-Scff. Fig. Dougl. & Scott, Brit. Hem. pl. vi. fig. 1.

Larger and narrower than the preceding, ochreous; frontal process produced and somewhat pointed. Thorax tricarinate. Antennæ with the club of 1st joint brown-black; apex of 3rd joint and the whole of the apical black. Knees thickened, infuscated, but sometimes scarcely darker than the rest of the thighs. Membrane with brown markings. The commonest species.

Length 2½—3 lines.

Common in moss.

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Neides.

1. Thorax posteriorly widened and raised .. .. *tipularius.*
2. Thorax posteriorly not widened or raised .. .. *parallelus.*

1. *tipularius*, Linn. Fig. Hahn, Wanz. Ins. i. fig. 68.

Very long and narrow, with exceedingly long thin legs, ochreous. Thorax convex, widened and much raised posteriorly, tricarinate. Corium with several black spots along the edge of the membrane. Thighs and 1st joint of antennæ club-shaped and slightly darkened. Apex of antennæ black. Apex of tibiæ and the tarsi black.

Length 5½—6 lines.

Bournemouth, Woking; by sweeping, &c.

2. *parallelus*, Fieb.

depressus, Dougl. & Scott.

So like the preceding that I need only point out the differences. The thorax is smaller, not raised posteriorly nor widened, the three carinæ being as nearly parallel as possible; it is also not convex as in *tipularius*. This insect is considered by Dr. Renton to be the unwinged form of *N. tipularius*.

Length 5½ lines.

Deal.

PYRRHOCORIDÆ.

Pyrrhocoris.

1. *apterus*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. vi. fig. 3.

Above flat, irregularly punctured, scarlet. Head and antennæ, centre of thorax (dorsal line sometimes excepted), scutellum, clavus, a very small black spot near each shoulder, and a round spot on the disk of the corium and the abdomen, except at its margins, black. Legs also black. Beneath black; margins of body and various spots on the thorax red.

Length 3½—4½ lines.

S. W. of England.

LYGÆIDÆ.

I. Basal joint of hind tarsi generally much longer, never shorter than 2nd and 3rd together.

A. Species very flat and wide, much dilated posteriorly .. .. *Gastrodes.*

AA. Species not much flattened and dilated.

B. Sides of the thorax without a well-defined lateral margin.

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C. Thorax constricted in the middle in a waist-like manner .. .. *Plociomerus.*

CC. Thorax not constricted in the middle in a waistlike manner.

a. Head exceedingly wide, eyes longly pedunculate .. .. *Henestaris.*

b. Head not so wide, eyes not pedunculate.. *Nysius.*

BB. Sides of the thorax with a well-defined lateral margin.

C. Membrane without cells.

D. Side margins of thorax foliaceous, or with a sharp leaf or knife-like edge throughout their length, often wider and pale near the middle, never thickened or narrowly reflexed.

E. Thorax with long hairs all over or only round the front margin .. .. *Eremocoris.*

EE. Thorax without long hairs.

F. Front margin of thorax constricted into a very short, sometimes raised collar.

a. 1st joint of antennæ as long as second .. *Notochilus.*

b. 1st joint of antennæ much shorter than 2nd .. .. *Scolopostethus.*

FF. Front margin of thorax not collared or raised.

G. Basal joint of intermediate tarsi longer than 2nd and 3rd together.

H. Eyes prominent, projecting beyond the sides of the thorax .. .. *Dieuches.*

HH. Eyes not prominent.

I. Antennæ covered with bristly black hairs .. *Emblethis.*

II. Antennæ not covered with bristly hairs .. *Calyptonotus.*

GG. Basal joint of intermediate tarsi shorter than 2nd and 3rd together .. .. *Trapezonotus.*

DD. Side margins of thorax not flattened or leaf-like, often raised or reflexed or thickened.

E. Sides without lateral carinæ .. .. .. *Tropistethus.*

EE. Sides with lateral carinæ.

F. Lateral carinæ visible from above.

G. Species linear, parallel sides (elytra almost always undeveloped).

a. 3rd joint of rostrum as long, or nearly as long, as 2nd; 2nd and 3rd abdominal segments above much and angularly produced posteriorly; the apex of the angle widely truncate .. .. .. *Macrodema.*

b. 3rd joint of rostrum much shorter than 2nd and 3rd, abdominal segments very slightly angulated, the apex of the 2nd very finely truncate .. .. .. *Ischnocoris.*

GG. Species not linear and parallel-sided.

H. Thorax more or less constricted (although sometimes very slightly) at or behind the middle, transversely impressed and punctured.

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I. Apical joint of antennæ shorter than 2nd.
J. Entire insect covered with projecting hairs .. *Pionosomus.*
JJ. Not covered with projecting hairs.
K. Thorax in front very shining and polished .. *Lamproplax.*
KK. Thorax in front not shining and polished .. *Drymus.*
II. Apical joint of antennæ as long or longer than 2nd .. .. *Rhyparochromus.*
HH. Thorax not constricted posteriorly.
a. Species not flattened or shining .. .. *Peritrechus.*
b. Species flattened, smooth and shining .. *Plinthisus.*
FF. Lateral carinæ not visible from above.
G. Anterior margin of thorax raised .. .. *Lasiosomus.*
GG. Anterior margin of thorax not raised.
H. Surface not pubescent .. .. *Acompus.*
HH. Surface pubescent .. .. *Stygnocoris.*
CC. Membrane with basal cells .. .. .. *Phygadicus.*
II. Basal joint of hind tarsi shorter than 2nd and 3rd together.
A. Sides of thorax not thin and knife-like.
B. Base of thorax emarginate .. .. .. *Ischnodemus.*
BB. Base of thorax not emarginate.
C. Head without processes between the antennæ and eyes .. .. *Ischnorhynchus.*
CC. Head with processes between the antennæ and eyes .. .. *Cymus.*
AA. Sides of thorax with a knife-like edge .. *Chilacis.*

Gastrodes.

I. Lateral margin pale and knife-like only posteriorly .. *ferrugineus.*
II. Lateral margin pale and knife-like throughout its length .. .. *abietis.*

1. *ferrugineus,* Linn. Fig. Dougl. & Scott, Brit. Hem. pl. vi. fig. 4.

Much depressed and dilated; dull brownish-red, head and front of thorax black, the latter largely and irregularly punctured, much wider behind than in front. Elytra widest about the middle, punctured in irregular lines. Legs red. Anterior thighs darker, thickened and denticulate on their front margin, with one larger spine in the middle. Antennæ red-brown; 2nd joint rather paler than the rest.

Length 3½ lines.

Not uncommon on fir trees.

2. *abietis,* Linn. Fig. Panz. Faun. Germ. 92, 22.

Very like the preceding, but differs in being paler and rather narrower; the front part of the thorax is highly

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polished, with only a few scattered punctures at the sides, and the entire lateral margin is pale and sharply carinated; the elytra are of a pale brown, with an elongate dark spot running from the membrane upwards along the juncture of the corium and clavus, also the front thighs are not darkened.

Length 3½ lines.

Very rare; on spruce firs.

Plociomerus.

I. Thorax hardly swollen in front, pale behind and scarcely pilose .. .. *fracticollis.*

II. Thorax very much swollen in front, entirely dark and densely pilose .. .. *luridus.*

1. *fracticollis*, Schill. Fig. Dougl. & Scott, Brit. Hem. pl. vi. fig. 5.

Ochreous-brown. Head and front half of thorax, except the anterior margin, black; base of the latter punctured with dark brown, and with a dark-brown cloud within each angle, the angles themselves pale; sides converging in the middle so as to form a sort of waist; scutellum brownish-black; clavus and corium pale, punctured with brown in lines; the nervures, margins, and a triangular spot on the corium on each side near the base of the membrane, pale ochreous-white. Membrane dusky, nerves paler, beneath black. Antennæ reddish-brown; apical joint darker. Legs clear testaceous-brown, hind thighs with a darker ring near the apex.

Length 2½—3 lines.

Not rare in the Fens, Cambridgeshire.

2. *luridus*, H.-Scff. Fig. H.-Scff. Wanz. Ins. fig. 356.

Reddish-brown. Head and thorax entirely very dark brown, the latter much swollen in front and much constricted in the middle, covered with dense fine hairs. Scutellum black. Elytra punctured with brown punctures in lines, darker towards the apex; membrane dusky, nerves pale; legs reddish-brown, the front ones with the centre of the femora dark. Antennæ reddish-brown.

Length 3 lines.

New Forest.

Shorter than the preceding, and at once distinguished by the swollen thorax in front and its hairy nature.

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Henestaris.

1. *laticeps*, Curt. Fig. Dougl. & Scott, Brit. Hem. pl. viii. fig. 5.

Head ochreous, spotted with black, exceedingly wide. Eyes pedunculate. Thorax punctured, pubescent, ochreous, more or less marbled longitudinally with shades of brown; dorsal line and lateral margins posteriorly paler. Scutellum reddish-brown, with a white silvery spot on each side of the base. Elytra punctured, clavus pale ochreous, punctured in lines, corium more or less ochreous at the base, reddish-brown posteriorly, with a small white spot near its interior apical angle. Membrane white. Nerves brown, the intervals between them finely and closely spotted with brown, especially towards the middle of the membrane, giving the appearance of a brown central stripe. Legs spotted with black, largely on the femora, finely on the tibiæ. Antennæ with the basal joint spotted; apical joint dusky.

Length 2½—3 lines.

Hab.—Sea shore; Dawlish, &c.

Nysius.

I. Scutellum with a pale central keel .. .. .. *brunneus.*
II. Scutellum without a pale keel .. .. .. *thymi.*

1. *brunneus*, Fieb. = *Scotti*, E. S.

Ochreous. Head and thorax deeply punctured, the former with a blackish line on each side inside the eyes, the latter with a narrow, pale, dorsal line. Scutellum largely punctured, with a strong, smooth, pale, longitudinal carina. Elytra: disk unspotted, apical margin more or less brown, especially at the apex of the corium itself. Membrane hyaline, clouded with brown. Antennæ: 1st joint spotted with brown, apical joint dusky; legs and thighs finely spotted with brown.

Length 2½ lines.

Hab.—Heaths; Woking, Reigate, Weybridge, Bournemouth, &c.

2. *thymi*, Wolff. Fig. Dougl. & Scott, Brit. Hem. pl. viii. fig. 4.

Of a greyer colour than the preceding. Head nearly black, covered with exceedingly fine silvery hairs, deeply punctured. Thorax deeply punctured, dark in front,

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with indications of a raised dorsal line at the base and at the anterior margin; posterior angles pale. Scutellum black or dark brown, sometimes with a streak on each side paler, deeply punctured. Elytra greyish-ochreous, more or less spotted on the nerves. Apical margin narrowly and interruptedly black. Membrane hyaline, clouded with brown. Antennæ obscure brown, 1st joint and apical joint darker. Thighs spotted with brown, varying much in the closeness and contiguity of the spots. Beneath sometimes ochreous, with a wide band on each side dark, sometimes almost black all over.

Length 2 lines.

Common in heathy places.

The form called by Messrs. Douglas and Scott *maculatus*, Fieb., I cannot consider as more than a dark variety of this very variable species.

Eremocoris.

1. *podagricus*, Fab.
   erraticus, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. vi. fig. 7.

Elongate-oval. Head and antennæ black. Thorax black, finely punctured and convex in front, brown, impressed and deeply punctured behind; sides pale. Scutellum black, deeply punctured. Elytra punctured, dull lightish-brown, a spot in the middle of each black; the anterior margin of the corium and the base of the elytra are usually more or less pale; membrane blackish, with a white spot on each side and pale nerves. Beneath black; coxæ and sides of mesosternum reddish. Legs reddish-brown; thighs darker.

Length 3 lines.

On junipers; Sanderstead, Reigate, Headley, &c.

2. *plebeius*, Hahn. Fig. Hahn, Wanz. Ins. i. fig. 33.

Brownish-black, dull. Thorax deeply and sparsely punctured behind; lateral margins dull red, surface covered with long projecting hairs, especially in front. Scutellum deeply punctured. Elytra reddish-brown at the base, clouded with dark brown posteriorly, with a small, long, black spot in the middle of each corium. Membrane black, with a white spot on each side. Beneath and legs black; tibiæ reddish-brown. Femora pilose.

Length 3 lines.

New Forest.

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Its dull appearance and the hairs on the thorax and legs at once separate this from *podagricus*.

Notochilus.

1. *limbatus*, Fieb. *Scolop. crassicornis*, Dougl. & Scott.

Ferruginous; head and front of thorax fuscous; base and hind angles also dark; elytra with a broad black band across the middle; apical margin also narrowly black. Membrane dusky, with a pale streak on each side. Antennæ thick; 1st joint red, the rest black. Legs red; apices of the thighs narrowly black.

Length 1½ line.

Southsea.

Scoloposthethus.

I. Thorax dark in front, pale behind.
- A. Antennæ entirely pale.. .. .. .. *pictus.*
- B. Antennæ with 1st and 2nd joints pale, rest black.. .. .. *adjunctus.*
- C. Antennæ with only the base of the 2nd and 1st pale—
  - a. Elytra finely hairy .. .. .. *affinis.*
  - b. Elytra glabrous .. .. .. *cricetorum.*

II. Thorax dark all over .. .. *contractus.*

1. *pictus*, Schill. Fig. Panz. Faun. Germ. 120—5.

Head black; thorax much wider behind than in front, ochreous-brown, punctured with darker brown, with the anterior margin narrowly red, and with a large quadrangular brown spot on its anterior half; lateral margins white, the white colour widening about the middle; posterior angles dark brown; there is also a brownish cloud above the scutellum which is black. Elytra ochreous, with occasional lines of brown punctures; apex of clavus, two spots on the corium side by side, one on the disk, the other on the lateral margin, and a broad band across the end, jagged on its upper margin, dark brown. Membrane white; a spot at the base and the nerves brown. Antennæ and legs testaceous; front femora and a ring on the hind femora brown.

Length 2 lines.

Fens, Cambridgeshire, &c.; rare.

2. *adjunctus*, D. & S. Fig. Dougl. & Scott, Brit. Hem. pl. vi. fig. 9.

I need hardly describe this, as the preceding is similar in almost every point except the following:—Thorax

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proportionately wider in front; antennæ more robust; 3rd and 4th joints thickened and black; posterior thighs entirely pale; membrane rudimentary.

Length 1¼ line.

Not uncommon in dry and sandy places. Var. prec.?

3. *affinis*, Schill. Fig. Hahn, Wanz. Ins. fig. 71 (*decoratus*).

A smaller insect than the preceding. Antennæ black except the 2nd joint, which is black only at its apex, and the 1st joint in the ♂. Elytra finely pubescent. Legs reddish-testaceous; thighs, 1st pair with a wide central band, 3rd pair with a narrow band near the apex, the 2nd pair generally only with a spot.

Length 1⅓ line.

Generally distributed.

4. *ericetorum*, Letts.

Exceedingly like the preceding: differs in having the elytra glabrous, the antennæ less thick, and their 2nd joint black, except at the extreme base. The thighs of the 2nd pair of legs have also generally a black apical ring.

Length 1⅓ line.

Under heath; common.

5. *contractus*, H.-Scff. Fig. Wanz. Ins. iv. fig. 440.

Dull black. Thorax deeply and coarsely punctured; lateral margins in the middle ochreous. Corium with the base and a small spot on the margin near the apex ochreous. Antennæ and legs black; apex of thighs, tibiæ and tarsi slightly paler.

Length 1⅓ line.

Common in moss, &c., almost everywhere.

Dieuches.

1. *luscus*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. vi. fig. 8.

Head black, covered with fine silvery hairs. Thorax in front with a black quadrangular spot. Anterior margin and sides white, posterior portion of thorax whitish, punctured with large brown punctures, posterior angles black. Scutellum with a spot on each side and the apex white. Clavus punctured with brown, and with a brown cloud-like spot near its middle. Corium whitish, punctured with brown in lines, except outwardly; a spot on

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each running from their juncture with the membrane to the exterior margin, and another at the apex, black, the space between these forming a conspicuous white spot. Membrane nearly black, with a spot on each side below the apex of the cuneus. Legs yellow; apex of thighs widely and of tibiæ narrowly black. Antennæ yellow; 1st joint, apex of 2nd and 3rd, and nearly the whole of 4th, black.

Length $2\frac{3}{4}$ lines.

West of England, Lizard, Torquay, &c.

Emblethis.

1. *verbasci*, Fab. Fig. Panz. Faun. Germ. 118—7 (*marginipunctatus*).

Oval; ochreous, covered with black punctures and larger puncture-like spots round the margins. Head and antennæ with short bristly hairs. Sides of thorax regularly rounded. Scutellum with two black spots near each anterior angle. Membrane spotted with dusky spots and with a black spot on each side of the base. Underside of thorax and sternum black, the latter with the posterior margin of each segment whitish; body ochreous-yellow, with a row of black spots along its margins.

Length 3 lines.

Deal.

Calyptonotus.

I. Species black; membrane with a yellow spot .. *Rolandri.*

II. Species brown and black.

A. Hind thighs not toothed.

B. Side margins of thorax entirely widely pale.

a. Tibiæ and tarsi black .. .. .. *lynceus.*

b. Tibiæ and tarsi pale .. .. .. *quadratus.*

BB. Side margins of thorax not widely pale .. *pini.*

AA. Hind thighs with a very small tooth near the apex.. .. .. *pedestris.*

1. *Rolandri*, Linn. Fig. Panz. Faun. Germ. 118, 3.

Dull black, glabrous; punctured membrane with a large spot at its base, orange-coloured.

I have foreign examples, in which the membrane is entirely pale orange-coloured; but I have never seen this variety from England.

Length 3—$3\frac{1}{2}$ lines.

Darenth, &c.

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2. *pini*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. vi. fig. 6.

Ochreous-brown, largely and irregularly punctured with black; elongate-oval. Head, front of thorax, scutellum, an elongate spot on the clavus, a somewhat triangular spot on each side just above the base of the membrane, the membrane itself, legs and antennæ, black; the front tibiæ reddish at their base.

Length 3½—4 lines.

At the roots of heath, &c., in sandy places; not uncommon.

3. *lynceus*, Fab. Fig. Panz. Faun. Germ. 118, 10.

Broad, oval, ochreous; punctured with large black punctures. Head, a large quadrangular patch in the front of the thorax, and an irregular-shaped spot on each corium just above the membrane, black, the latter spot having a small round white spot in its apex, membrane brown; scutellum black, with an elongate ochreous spot on each side near the apex. Sides of thorax pale, translucent and impunctate. Legs and antennæ black, the front tibiæ pale, except at the apex; the other tibiæ pale at their extreme base; junctures of 1st and 2nd and 2nd and 3rd joints of antennæ also pale.

Length 3½ lines.

Rare; Deal, Dartford, Croydon, I. of Wight, at roots of grass.

4. *quadratus*, Fab. Fig. Panz. Faun. Germ. 118—9.

Elongate-oval, ochreous-brown, punctured with darker brown; sides of thorax and elytra impunctate, smaller than the preceding. Head, a quadrangular spot on the front of the thorax, scutellum, and a somewhat elongate spot on the corium on each side just above the membrane, black. Membrane pale, with a dark central streak. Femora black, with their extreme apices red. Tibiæ red, dusky at their extremities. Antennæ: 1st joint black, with its apex red, 2nd and 3rd dull red, dusky at the apex, terminal joint dusky.

Length 3 lines.

Rare; Llandudno.

5. *pedestris*, Panz. Fig. Panz. Faun. Germ. 92, 14.

Narrow for one of this genus. Bright orange-brown, punctured. Head, front of thorax, its posterior angles, a round spot on each corium behind the middle, black. A spot on each side of the thorax above the black angle, and one immediately below each spot on the corium, white.

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Anterior margin of the corium, a streak on the clavus, and a streak on the disk of the corium, pale, but not quite white. Membrane black, with a white apical spot. Antennæ black, 2nd joint yellowish. Legs: front femora black, except at the base and apex, tibiæ yellow, black at apex; tarsi black, except 1st joint. Hind legs yellow, ends of the joints black, posterior thighs with a small tooth. Beneath black, with two or three white spots on the thorax, and a transverse white band on each side of the mesosternum.

Length 2½ lines.

Not common; on sandy banks and rotten trees, Chobham, Lee, Purley Downs.

Trapezonotus.

I. Legs without spiny hairs .. .. *distinguendus.*
II. Legs with spiny hairs .. .. *agrestis.*

1. *distinguendus*, Flor. Var. *distinctus*, Dougl. & Scott.

Elongate-oval, depressed, ochreous-brown. Head bronzy, finely and closely punctured. Thorax black in front, covered with adpressed silvery hairs, posteriorly ochreous, largely punctured with black, lateral margins pale. Scutellum black, an elongate triangular spot on each side, and the apex yellowish. Elytra ochreous, punctured with black, darker towards the apex. Membrane dusky brown. Nerves interruptedly paler. Antennæ brownish-black, 3rd joint with a red central ring. Thighs black, apices pale, tibiæ and tarsi reddish, apex of latter darker.

Length 2 lines.

Rare; I. of Wight.

2. *agrestis*, Panz. Fig. Dougl. & Scott, Brit. Hem. vii. fig. 2.

Oval, ochreous, punctured with black. Head, front part of thorax and scutellum black. Thorax with the lateral margin entirely pale. Corium with an irregular dark spot on each side near the internal angle. Membrane dusky, nerves white. Antennæ black in the ♂, with the 1st joint yellow. Legs, ♂, 1st pair entirely yellow, hind pairs black, except the extreme apex of knees; ♀, front pair with the apex of knees and the tibiæ yellow, others as in ♂.

Length 1½ line.

Common in moss, &c., especially in sandy places.

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TROPISTETHUS.

1. *holosericeus*, Hahn. Fig. Dougl. & Scott, Brit. Hem, pl. vii. fig. 5.

Head, thorax, scutellum and antennæ dull black. Entire insect covered with fine, slightly projecting hairs. Elytra ochreous; a spot on each, just above the membrane and the exterior margin posteriorly, fuscous. Membrane whitish. Thighs testaceous-brown, paler at the apex; front pair with a row of small teeth below, tibiæ and tarsi pale testaceous.

Length 1 line.

Rare; Ventnor, South Devon, Buckland and Reigate Hills; at the roots of grass, in moss, &c.

ISCHNOCORIS.

1. *hemipterus*, Sahlb. Fig. H.-Scff. Wanz. Ins. i. fig. 37 (*staphyliniformis*).

Elongate, parallel-sided, dull. Head black. Thorax nearly square, dull black, with a pale patch near each posterior angle punctured with black. Scutellum black, apex flavous. Elytra almost always rudimentary, pale ochreous, with lines of black punctures. Abdomen black, covered with fine depressed hairs. Antennæ brown; apex of 1st joint yellow; 2nd joint yellow, except at the base. Front thighs black, yellow at apex; tibiæ and tarsi testaceous; posterior legs testaceous, thighs with a black ring near the apex. This last character is very variable.

Length 1½ line.

Common in moss, &c., in heathy places.

I have a developed specimen of this species from abroad, in which the membrane is entirely dull fuscous.

MACRODEMA.

1. *microptera*, Curt. Fig. Dougl. & Scott, Brit. Hem. vii. fig. 7.

Elongate, parallel-sided, shining. Head, thorax, except a transverse streak at the base, scutellum, abdomen, legs and antennæ, black, sometimes with a bronzy tinge. Streak at the base of the thorax and elytra ochreous-brown; the latter with rows of black punctures and a dark external spot near the apex. Head and thorax remotely punctured. Abdomen above finely and closely punctured on the first two segments that are visible below

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the elytra, which are much and angularly produced in their centres, and truncate; remotely punctured on the other two segments. In the developed form the membrane is whitish with the centre clouded.

Length 2 lines.

Not uncommon in moss in heathy and sandy places.

Pionosomus.

1. *varius*, Wolff. Fig. Dougl. & Scott, Brit. Hem. pl. vii. fig. 3.

Head and thorax black, punctured, covered with bristly hairs; the latter with two pale spots at the base. Scutellum black. Elytra dull ochreous, hairy, with lines of black punctures; on each side on the lateral margin are three brownish spots, a small one near the base, a larger transverse one in the middle, and a third at the apex of the corium. Membrane dusky, with a white spot at the base and another on each side below the apex of corium. Antennæ black; 2nd joint, except the apex, red; femora black; tibiæ red.

Length 1½ line.

Very rare; sandhills near Sandwich (Curtis).

Lamproplax.

1. *piceus*, Flor. Fig. Dougl. & Scott, Ent. Mo. Mag. vol. iv. pl. ii. fig. 1 (*Sharpi*).
   = *Sharpi*, Dougl. & Scott.

Clear brown, shining. Thorax with a few scattered, long, upright hairs. Head, thorax and scutellum rather darker than the elytra. Thorax very shining and polished in front, and very coarsely punctured behind. Scutellum raised and coarsely punctured. Elytra punctured in lines on the clavus; corium with two parallel lines close to the clavus, and with some scattered punctures towards the lateral margin. Membrane more or less dusky. Legs clear testaceous-brown. Antennæ pitchy-brown, finely hairy; apical joint paler.

Length 2—2½ lines.

Scotland, New Forest, Wimbledon, Chobham; in damp places at the roots of plants, &c.

Drymus.

I. Legs without long projecting hairs.

A. Sides of thorax much rounded in front, and much constricted behind .. .. .. *brunneus*.

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AA. Sides of thorax not much rounded in front, nor constricted.
a. Species short and robust; legs black .. *sylvaticus.*
b. Species subelongate; legs pitchy-brown *pilicornis.*
II. Legs with long projecting hairs on the tibiæ .. *pilipes.*

1. *sylvaticus*, Fab. Fig. Hahn, Wanz. Ins. i. fig. 115.
Head, thorax, scutellum, antennæ and legs black. Thorax largely and coarsely punctured all over. Scutellum largely punctured, strongly impressed in the middle. Elytra ochreous-brown; first internal nerve of the corium black at its apex, whitish at its base; 2nd and 3rd nerves more or less darkened; external margin pale; membrane pale dusky-brown.
Length 2—2½ lines.
Very common.
Var. *Ryei.* Elytra chestnut-brown, wider posteriorly.

2. *brunneus*, Sahlb. Fig. Dougl. & Scott, Brit. Hem. pl. vii. fig. 4.
Head and thorax pitchy-black, very coarsely punctured; the latter with its sides rounded in front, and very much sinuated behind the middle; base rather paler than the front portion, impressed, and much more strongly punctured. Scutellum black. Elytra chocolate-brown; bases of the nerves and of the lateral margin, and a roundish spot between the 1st and 2nd nerves of the corium, pale ochreous; membrane dusky; nerves slightly paler. Antennæ and legs pitchy-brown; apex of former, tibiæ and tarsi paler.
Length 2—2½ lines.
Not uncommon in dead leaves, &c.

3. *pilicornis*, Muls. = *latus*, Dougl. & Scott.
Dull chocolate-brown. Head, front part of thorax, scutellum, abdomen and antennæ, except the first joint, pitchy-black. Thorax much widened posteriorly; finely punctured in front, coarsely behind; lateral margins brown, slightly reflexed. Scutellum largely punctured, raised at the sides and impressed in the middle. Elytra deeply punctured in lines. Antennæ with long projecting hairs.
Length 3 lines.
Hurst, Sussex; in moss.

4. *pilipes*, Fieb.
Head, front of thorax, and sometimes the whole of it, scutellum and antennæ black. Thorax finely punctured

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in front, and slightly sinuate at the sides; coarsely punctured behind, where it is of a piceous colour, as also on the lateral margins. Elytra chocolate-brown; suture between the clavus and corium, a short streak on the interior nerve, and the lateral margins at the base, pale; the pale streak on the inner nerve is followed by a longer black one. Membrane pale dusky, with a small black spot on the margin, below the apex of the second nerve of the corium; thighs black, except at the extreme apex; tibiæ piceous, with long projecting hairs.

Length 2—3½ lines.

Hab.—Moss; Croydon, Mickleham, Betchworth.

Rhyparochromus.

I. Surface of thorax dull.
  A. Species wide, black, or nearly so .. .. *dilatatus.*
  AA. Species narrower; elytra with lighter markings.
    a. Tibiæ black at apex .. .. .. *chiragra.*
    b. Tibiæ entirely pale .. .. .. *sabulicola.*

II. Surface of thorax bright and shining.
    a. Elytra glabrous, pale, with a black band at the apex .. .. *prætextatus.*
    b. Elytra hairy, dark, somewhat paler at the base .. .. *antennatus.*

1. *chiragra*, Fab. Fig. Panz. Faun. Germ. 122—8.

Entire insect clothed more or less with projecting hairs. Head, thorax and scutellum black; the latter with the sides rounded in front. Scutellum very largely punctured, triangularly raised at the base, with an impression within the raised portion. Elytra luteous; nerves and a large irregular-shaped spot towards the apex black. Antennæ black; 2nd joint red, except at its apex. Thighs black; red at the base; tibiæ red; black at the apex; tarsi reddish, dusky at the apex.

The markings of the elytra are very variable, and often the general colour is suffused into the spots, so that they are hardly distinguishable.

Length 2—2½ lines.

Hab.—Common in moss, among dead leaves, &c.

2. *sabulicola*, Thom.

Only differs from the above in having the tibiæ entirely pale, the second and third joints of antennæ pale, except at their extreme apices, and the thorax less deeply punctured at the base. It is also generally smaller in size.

Length 2 lines.

Hab.—Deal; on sandhills.

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3. *dilatatus*, H.-Scff. Fig. Dougl. & Scott, Brit. Hem. pl. vii. fig. 6.

Black, covered with more or less depressed golden hairs. Elytra of a pitchy hue. Membrane with a pale-reddish spot at the base. Head, thorax and scutellum coarsely punctured, especially the posterior portion of the latter. Elytra more finely punctured. Legs black, tarsi reddish.

Length 2½—3 lines.

Hab.—Moss, in sandy localities.

Much wider than the preceding and more oval in shape; cannot be confounded with any of our species.

4. *prætextatus*, H.-Scff. Fig. (*maculipennis*) Curtis, Brit. Ent. xiii. pl. 612.

Smooth, shining. Head, thorax and scutellum black, deeply and coarsely punctured. Elytra pale testaceous, punctured in lines, with a wide band at the apex black. Membrane fuscous, pale at the base. Beneath black. Antennæ black, apex of 1st and 2nd pale. Legs testaceous; front thighs, except at the apex, black; posterior pairs sometimes with a brownish spot or band towards the apex.

Length 2½—3 lines.

Hab.—Not uncommon on sandy sea shores.

5. *antennatus*, Schill. Fig. Hahn, Wanz. Ins. i. fig. 35.

Head and thorax black, shining, the latter very coarsely punctured posteriorly, much narrowed just above the base. Elytra much widest posteriorly, more or less pale at the base, the rest black, entirely clothed with fine yellowish hairs. Membrane rudimentary. Legs testaceous. Antennæ: 1st joint black, its apical half yellow; 2nd joint yellow, 3rd and 4th thickened and black.

Length 2⅛ lines.

Not common in moss; Reigate Hill, Isle of Wight, &c.

Peritrechus.

1. Membrane with a white apical spot .. .. *luniger*.
2. Membrane without a white apical spot .. *nubilus*.

1. *luniger*, Schill. Fig. Dougl. & Scott, Brit. Hem. pl. vii. fig. 1.

Ochreous-brown, with sparse, very short, golden hairs visible only under a tolerably strong power. Head black. Thorax black in front; behind brownish, with large darker brown punctures. Sides in the middle pale. Scutellum black. Elytra pale ochreous, punctured with black in

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lines. Spaces between the 1st and 2nd and 2nd and 3rd nerves of the corium white just above the membrane, then black, and then whitish again nearer the base: the black spots larger than the white ones; exterior apical angle of corium black. Membrane black, a round spot at the base and apex, and a spot on each side below the apex of the corium, white, nerves pale. Antennæ black, base of 2nd joint red; legs black; front tibiæ, except their apex, red.

Length 2½ lines.

Not uncommon in heathy places.

2. *nubilus*, Fall.

Brownish-grey. Head black, rugosely punctured. Thorax black in front, covered with fine silvery hairs, paler posteriorly. Scutellum black; apex with a yellow line at each side. Elytra dull ochreous-grey, punctured in lines with black and irregularly spotted with brown. Thighs black, their apices and tibiæ, except at the base, generally pale; tarsi pale, apex darker.

Length 2½ lines.

Common among dead leaves, &c.

Typical form very rare. Var.? *puncticeps*, Thoms. narrower, darker. Head more deeply and largely punctured. Eyes more prominent. Elytra less mottled. Scutellum with the apex only pale.

Plinthisus.

I. Thorax as wide in front as behind .. .. .. *brevipennis.*
II. Thorax narrower in front than behind .. .. *bidentulus.*

1. *brevipennis*, Lat. Fig. Dougl. & Scott, Brit. Hem. pl. vii. fig. 8.

Depressed, black, shining. Thorax nearly square, finely punctured in front, more coarsely posteriorly; basal margin pitchy-brown. Elytra pitchy-black, punctured in lines on the clavus and portion of corium adjoining it, irregularly on the rest, always undeveloped and truncate posteriorly; legs and antennæ pitchy-brown, the former lighter towards the apex.

Length 1¼—1½ line.

Common in sandy places.

2. *bidentulus*, H.-Scff. Fig. H.-Scff. Wanz. Ins. vi. fig. 588.

Depressed, shining. Head, thorax and scutellum pitchy-black, punctured, the latter widest behind, basal margin

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narrowly pale piceous. Elytra punctured, clavus pale piceous; corium piceous, a good deal darker than the clavus, region of the central nerve pale. Membrane somewhat of a yellowish-milky colour, darker in the middle; legs piceous.

Length 1¼—1⅓ line.

Rare; Dartford Heath.

Lasiosomus.

1. *enervis*, H.-Scff. Fig. H.-Scff. Wanz. Ins. vi. fig. 618.

Clear testaceous-brown, shining, sparsely covered with long hairs, which are suberect on the thorax and scutellum and adpressed on the elytra. Head and front of thorax and scutellum pitchy-brown, very coarsely punctured; anterior margin of thorax raised and testaceous; elytra, clavus with three rows of punctures, corium with two parallel rows next the clavus and some scattered punctures near the apex; membrane clear and hyaline; abdomen pitchy-brown.

Length 2¼ lines.

Chatham.

Acompus.

1. *rufipes*, Wolff. Fig. Dougl. & Scott, Brit. Hem. pl. viii. fig. 1.

Head, thorax, scutellum and body black, coarsely punctured above, covered with silvery hairs below. Elytra punctured in lines, pale ochreous-yellow, a spot at the apex of the corium near the inner angle black, the outer angle brown; membrane milky, with a few brownish spots; antennæ and legs red, apex of former black.

Length 2⅓ lines.

Fens and marshes, not rare.

Almost always undeveloped.

Stygnocoris.

I. Insect black, covered with yellowish hair .. .. *rusticus.*

II. Insect brown.

a. Legs clear testaceous .. .. *sabulosus.*

b. Legs brown or pitchy .. .. *arenarius.*

1. *rusticus*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. vii. fig. 9.

Widest posteriorly. Black, coarsely and closely punctured, covered with yellowish hairs, external margins of

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elytra more or less pitchy; antennæ and legs red, apical joint of former dusky; membrane, when present, dusky, the nerves widely pale.

Length 2—2½ lines.

Common, where it occurs, but local, on *Pulicaria dysenterica*, Cowes, September (Dougl. & Scott).

The developed form is exceedingly rare. Chobham, 1874, 1 spec.; Teignmouth, Wollaston (type of *Stethotropis*), are the only recorded instances of its capture to my knowledge.

2. *sabulosus*, Schill. Fig. Hahn, Wanz. Ins. i. fig. 117.

Clear brown, covered with rather long brownish hairs, slightly shining; much smaller than preceding. Head pitchy-black; thorax very coarsely punctured and covered with long hairs, pitchy-brown on the disk; anterior margin and the base, especially the posterior angles, paler; scutellum pitchy-black, coarsely punctured; elytra testaceous-brown, corium with a line along the margin widening posteriorly and becoming suffused into an irregular patch across the apex, piceous; membrane somewhat dusky, base paler.

Length 1½ line.

Common in sandy places.

3. *arenarius*, Hahn. Hahn, Wanz. Ins. i. fig. 27.

Dull brownish-black, covered with short adpressed brownish-yellow hairs. Head and thorax deeply and coarsely punctured, slightly paler posteriorly; elytra more or less fuscous, corium with an irregular spot near the apex of clavus, and another covering its own apex darker; membrane dusky, nerves pale; antennæ and legs pitchy-brown, apex of former darker.

Length 1½ line.

Common in sandy places and elsewhere.

Phygadicus.

I. Thorax with long projecting hairs .. .. .. *urticæ*.
II. Thorax without long projecting hairs .. .. *artemisiæ*.

1. *urticæ*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. viii. fig. 3.

Head and thorax bronzy-black, covered with somewhat long whitish hairs, deeply and coarsely punctured; base of the latter more or less white, especially in the middle. Scutellum bronzy; extreme apex white. Elytra punctured and covered with short whitish hairs, dull ochreous, more

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or less spotted or mottled with black; membrane diaphanous. Connexivum black, with yellowish spots. Legs and thighs black, more or less spotted, pale at the base; tibiæ ochreous, each with three black rings. Tarsi ochreous, apex of 1st and 3rd joints black. Antennæ: 1st joint bronzy, its apex and the other joints pale.

Length 3 lines.

Not uncommon, but local; by sweeping among nettles, &c. in summer.

2. *artemisiæ*, Schill.

Head and thorax black, covered with exceedingly short silvery hairs, base of latter dull ochreous. Scutellum black, apex ochreous. Elytra dull ochreous, covered with same sort of pubescence as the thorax, with a more or less distinct brown spot at the inner apical angle, sometimes extending almost across to the lateral margin. Legs thick and short; thighs black, apex ochreous-red; tibiæ ochreous-red, in front legs with the base only, on the others also with a spot above the apex, black. Antennæ: 1st joint black, its apex pale; other joints ochreous, with the extreme base black and the apex more or less dusky.

Length 2—2½ lines.

Reigate Hill, Mickleham, &c. In moss, &c.

Ischnodemus.

1. *sabuleti*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. viii. fig. 2.

Elongate, parallel, much depressed; head and thorax dull black, posterior angles of the latter pale. Elytra pale ochreous, suture between the clavus and corium, a line on the corium parallel to it, another line parallel to the lateral margin joined together along the apical margin, thus enclosing a sort of triangular space, brown. Membrane white, with a brown cloud across the middle and the nerves brown. Femora black, their apices, tibiæ and tarsi reddish.

Length 3 lines.

Merton and Folkestone.

This species is very rare in the developed form; in undeveloped specimens the elytra are rudimentary ochreous, with the same arrangement of brown lines; the abdomen, of which five segments are visible, is black, densely covered with silvery hairs.

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Ischnorhynchus.

I. Species larger, 2½ lines, darker; found on alder .. *Didymus.*
II. Species smaller, 1¾ line, paler; found on heath .. *geminatus.*

1. *Didymus*, Zett. Fig. (*resedæ*) Panz. Faun. Germ. 40—20.

Oval, chestnut-brown; head and thorax closely punctured, the latter with a black band across the front. Scutellum black at the base. Elytra outwardly paler; corium punctured only between the discal nerves and along the claval suture; near the centre of the corium on each of the nerves is a small black spot; there are also two small spots on the apical margin, one at the extreme apex the other at the apex of the exterior discal nerve. Membrane large and hyaline; legs same colour as the insect, with the apex of tarsi black; 1st joint of antennæ, base and apex of 2nd, and apical joint, black.

Length 2½ lines.

Alders. Local.

2. *geminatus*, Fieb. Fig. (*resedæ*) Dougl. & Scott, Brit. Hem. pl. viii. fig. 7.

Almost a fac-simile of the former, two or three sizes smaller; it is paler and rather more shining, and the membrane is less large and voluminous; there is also generally a rime-like appearance on the thorax; scutellum and clavus not visible in the preceding, otherwise the same description will apply to both.

Length 1¾ line.

Common on heath.

Cymus.

I. Scutellum with a pale keel or line down the middle.
  a. Apical margin of corium not brown .. .. *glandicolor.*
  b. Apical margin of corium brown .. .. *claviculus.*
II. Scutellum without a pale keel or line .. .. *melanocephalus.*

1. *glandicolor*, Hahn. Fig. Hahn, Wanz. Ins. i. fig. 45.

Pale ochreous, largely punctured. Head reddish. Thorax with a pale dorsal ridge in front. Scutellum with a thick pale carina. Corium paler than clavus, with a darker cloud on each side above the base of the membrane. Membrane slightly smoky. Legs and antennæ ochreous; apical joint of latter fuscous.

Length 2 lines.

Common in damp places.

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2. *claviculus*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. viii. fig. 8.

Differs from preceding in being smaller and having the elytra of a less oval shape. The scutellum also is less strongly carinated, and the apical margin of the corium is brown and much shorter.

Length 1½—1¾ line.

Common by sweeping, &c.

3. *melanocephalus*, Fieb.

Nearest allied to *claviculus;* differs in its darker colour, especially the darker colour of the head and front of thorax, in having the keel of the thorax concolorous and in not having any keel on the scutellum, and also in the punctuation of the corium, which is irregular all over; whereas, in *claviculus*, along the claval suture there are two subparallel rows of punctures with an impunctate space between them, the rest being closely and irregularly punctured.

Length 1¾ line.

Not uncommon in damp places, Chobham and Reigate; probably generally distributed, but overlooked.

Chilacis.

1. *Typhæ*, Perris. Fig. Dougl. & Scott, Brit. Hem. pl. viii. fig. 6.

Oval, depressed, ochreous, shining. Thorax with the surface somewhat uneven and irregularly punctate. Scutellum punctured with black in the middle; sides slightly raised and pale. Elytra pale ochreous. Clavus punctured in lines; corium irregularly. Membrane hyaline. Legs and antennæ pale.

Length 2 lines.

Heads of bulrushes; Charlwood and Stockton.

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VIII. *Description of a new species of* Prosopocœlus (Coleoptera, Lucanidæ). By Major F. J. Sydney Parry, F.L.S.

[Read 3rd May, 1875.]

Prosopocœlus Wimberleyi, sp. nov.

♂, var. max. *P. Oweni* proximus, rufo-castaneus, subnitidus.

Mandibulæ capite paulo breviores, subdeplanatæ, basi fortiter emarginato, intus tuberculo parvo notato, supra subapicale serrato-dentatæ, et infra in medio spino deflexo armatæ.

Caput magnum, deplanatum, crebre granulosum, pone oculos tuberculo porrecto armatum; supra carinis duabus nigris arcuatis, postice fere conjunctis.

Prothorax capite latior confertissime granulosus, angulis anticis et posticis rotundatis, maculâ nigrâ versus angulos posticos; marginibus tenue nigris, lineâ medianâ vix distinctâ.

Elytra castanea, tenuissime granulosa; *scutello* lineâ basali, limbo externo suturâque nigris; *corpore* subtus, *pedibus*que nigro-tinctis, *tibiis* extus inermibus.

Long. corp. lin. 11; mandib. lin. 3.

This species is closely allied to *P. Oweni*, Hope, but is easily distinguished from it by its light chestnut colour, the mandibles less circumflex, the internal basal tubercle, the carinæ on the upper surface of the head extending from the centre to the ante-ocular angles, the posterior angles of the prothorax being entirely rounded, exhibiting no indication as in its allied species of being denticulate.

We are indebted to Capt. R. Wimberley for this interesting addition to the Lucanoid *Coleoptera*, as well as for much valuable knowledge of the general entomology of the same locality.

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IX. *Description of the male of* Alcimus dilatatus, *Fairm.*

By Charles O. Waterhouse.

[Read 3rd May, 1875.]

This insect was originally described by Fairmaire (in the Rev. Zool. 1849, p. 416), from a female example, and as the male appears to be unnoticed, I subjoin a short description.

♂. Latus, leviter convexus, obscure castaneus, nitidus; mandibulæ capite paulo longiores, curvatæ, apice attenuatæ, basi subtus tuberculo parvo, supra pone medium dente cylindrico recurvo armatæ. Caput subtilissime coriaceum, pone oculos dente parvo armatum. Thorax capite paulo latior, longitudine duplo latior, lateribus parallelis, marginibus incrassatis subcrenatis, angulis posticis rotundatis; supra subtilissime coriaceus, dorso fere lævi. Elytra thoracis latitudini æquantia, fortiter striata, striis impunctatis, interstitiis subplanis crebre fortiter punctatis.

Long. cum mand. 13 lin.; lat. 5¼ lin.

♂, *var. minor.* Mandibulæ capite paulo breviores. Caput circa oculos parce fortiter punctatum, pone oculos rotundatum. Thorax transversus, antice paulo angustatus, nitidus, latera versus parce fortiter punctatus. Elytra lateribus minus parallelis.

Long. cum mandib. 9 lin.; lat. 4 lin.

Hab.—Samoa Is.

The large development is in Major Parry's collection; the smaller one is in the British Museum, and was collected by the Rev. S. J. Whitmee. Both specimens are from the same locality. The female was described from Wallis Island, a small island at some distance from the main island, but belonging to the Samoas.

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X. *Description of a new species of* Myriopod *from the borders of Mongolia.* By Arthur G. Butler, F.L.S., F.Z.S., &c.

[Read 5th July, 1875.]

The following species has recently been purchased of Mr. Whitely for the National Collection; it was obtained, with a number of Lepidoptera and Coleoptera, by two German traders.

Genus Sphærotherium, Brandt.

Sphærotherium nebulosum, n. sp.

Ochraceous, becoming gradually paler towards the anal segment, spotted here and there with brown; first six dorsal segments mahogany-coloured above and crossed transversely by submarginal black bands, remaining segments with narrow submarginal grey bands, posterior margins of the segments tawny; head and nuchal plate sordid clay-colour, with blackish spots and testaceous margins; antennæ olivaceous.

Head coarsely and very densely punctured, nuchal plate more coarsely but less densely punctured, with clearly defined anterior ridge; antennæ and mandibles clothed with short bristles; anterior dorsal segments slightly rugulose at the sides, the first two or three segments also slightly rugulose behind; laminæ of first segment narrow, with very narrow marginal ridge; last dorsal segment obliquely arched and laterally slightly compressed.

Length 10 lines; width of first dorsal segment 5 lines.

Nankow Pass, between Mongolia and China (*Swinhoe*). Type, B. M.

Allied to *S. javanicum*, but easily distinguished by the much more rugose characters of its head and nuchal plate.

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XI. *A Sketch of our present knowledge of the Neuropterous Fauna of Japan* (*excluding* Odonata *and* Trichoptera). By R. M'Lachlan, F.L.S., &c.

[Read 7th June, 1875.]

As a continuation of the numerous memoirs on the Entomology of Japan that have appeared in our Transactions during the two preceding, and present, years, I offer a short sketch of our knowledge of a portion of the Neuropterous Fauna of the islands. The dragon-flies (*Odonata*) are omitted, because in them no materials have come before me; and I think that my friend Baron De Selys-Longchamps has the idea of publishing an account of those that are known to him at no distant date. The *Trichoptera* are not at present included, because, owing to pressure of other work, I have not been able to find time to make the drawings so indispensable when treating upon them; it must suffice to say here that the group is numerously represented in Japan, and contains many extraordinary forms. Limiting myself, therefore, to the *Pseudo-Neuroptera* (excluding *Odonata*) and *Planipennia*, I can enumerate only about 45 species, and of these some are not described for want of sufficient material.

It is to the collections made by Mr. H. Pryer, of Yokohama, and sent by him to his relative, Mr. Wormald, that I am indebted for an opportunity of studying the greater part of the insects here noticed. From Mr. George Lewis I have received several interesting species. In addition to these, some species exist in the collection of Baron De Selys-Longchamps (to whom I am indebted for duplicates), in that of the British Museum, and in my own. Lastly, and by no means of the least importance, Mr. Ritsema, of the Royal Museum of Natural History at Leyden, has entrusted to me a small collection, chiefly formed by Von Siebold the well-known traveller in Japan. Instigated by a knowledge of the exclusive privilege of trading with Japan so long possessed by Holland, it occurred to me to apply to Mr. Ritsema, and the result is that he forwarded to me several forms of the highest interest, and which have not been found by subsequent explorers.

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The species known to occur in Japan may be referred to the following families:—

Ephemeridæ,	5 species.	*Mantispidæ*,	1 species.
Perlidæ	9 „	*Hemerobiidæ*	1 „
Sialidæ	3 „	*Osmylidæ*	4 „
Raphidiidæ	1 „	*Chrysopidæ*	4 „
Myrmeleonidæ	5 „	*Panorpidæ*	10 „
Ascalaphidæ	2 „		

With these limited materials it would be unsafe to generalize upon any faunistic peculiarities presented by them. One of the most interesting facts is the occurrence of an endemic species of the restricted genus *Ascalaphus*, a genus that has its head-quarters on the northern shores of the Mediterranean, although one species is known to occur in Mongolia and Eastern Siberia. The most striking feature is the number of interesting *Panorpidæ*, including forms that have rendered necessary the construction of two new genera; and large as the number already is, it may be considered practically certain that it only represents a tithe of the species that exist.

EPHEMERIDÆ.

Ephemera, Linné (restricted).

E. orientalis, sp. nov.

Pale greyish-yellow, a long black streak on each side of the mesonotum. Abdomen above narrowly-blackish at the sutures; the first three or four segments and the two apical ones without longitudinal lines; the intermediate with five black longitudinal lines, whereof one is straight and central, with two on each side slightly curved; tails yellowish, the basal portion unannulated, afterwards with narrow-blackish sutural annulations; appendages rather short; the two apical joints short; penis divided to its base, the two lobes dilated at the apex and there approximate; the underside of the abdomen with only two lines (one on each side, and those straight) on the intermediate segments. Legs pale yellow, the anterior tibiæ and tarsi fuscous; the tarsi transversely corrugated. Anterior wings vitreous, with a yellowish tinge; neuration blackish, costal veinlets incrassate and deep black; the nodal veinlets strongly margined with blackish, and there are one or two other blackish points; posterior wings immaculate, but with a rather broad pale-greyish border. (♂ imago.)

Expanse 32 mm.

In the Leyden Museum; captured by Von Siebold.

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By the nature of the markings of the abdomen, this bears some slight resemblance to the European *E. lineata*, Eaton; the individual is in indifferent condition.

E. japonica, sp. nov.

Very pale yellow, a black line on each side of the pronotum; the abdominal segments above, before the apex, with a very oblique narrow black line on each side, thus: \/, beneath with similar lines; on the segments immediately before the penultimate there is also frequently a short, black, central line; tails brownish, the sutures black, and the base dark fuscous, almost blackish; appendages of the ♂ pale yellowish-white; the second joint very long and slender, and strongly curved outwards; the two terminal joints (3rd and 4th) very short; the 3rd fuscous, the basal joint very short; penis notched at the apex, the two points turned inward. Legs very pale yellow; in the anterior pair the tips of the femora, and the whole of the tibiæ and tarsi, fuscous. Wings very pale greenish-yellow, with blackish veins; in the ♀ there is a small nodal point, and another discal (still more minute), fuscous; in the ♂ the anal portion of the anterior wings has a narrow greyish border, and there is a broader border to the posterior wings in both sexes.

The sub-imago only differs in that the colour of the body is duller and the wings slightly less transparent.

Expanse ♂ 26 mm., ♀ 32 mm.

Yokohama (*Pryer*).

A delicate insect, with very evanescent appearance.

Both these Japanese species are distinct from the Chinese *E. serica*, Eaton, which should perhaps be placed between them; it differs in markings, and also especially in the long and slender apical joints of the appendages in the ♂.

LEPTOPHLEBIA, Westwood.

L. elongatula, sp. nov.

(♀ imago.) Dark liver-colour. Legs pale yellowish; anterior pair almost wholly fuscous, the femora paler; posterior tarsi 4-jointed. Tails blackish-fuscous. Anterior wings elongate, narrow, vitreous, with the costal margin narrowly brownish-yellow; neuration fuscescent, yellowish at the base, and the subcosta and radius yellowish in their

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basal half; inner marginal area almost without transverse nervules; costal area at the apex with two rows of large irregular cellules. Posterior wings nearly orbicular; costal margin strongly arcuate and without any projection.

(♀ subimago.) Head and thorax dull greyish-fuscous; abdomen blackish-fuscous, darker at the sutures. Legs dull pale-yellowish. Tails black. Wings smoky-grey, with black veins; the anterior pair with the costal margin broadly ferruginous.

Expanse 27 mm. Length of anterior wing 14 mm., of posterior 3¾ mm.

Yokohama (*Pryer*).

In the absence of the ♂ the most striking character of this species is the broad ferruginous costal margin of the anterior wings of the sub-imago.

Dipteromimus, gen. nov.

♂. Eyes very large, but probably simple. Abdomen long and slender; last ventral segment completely separated laterally from the dorsal, forming a sub-quadrate plate bearing the forceps, which are four-jointed; penis long and slender; two tails. Anterior legs very slender. Anterior wings long and very narrow, especially at the base; transverse veinlets numerous and disposed over all the wing; no rudimentary marginal veinlets. Posterior wings very minute, narrow, the costal margin simple.

Although the insect upon which this genus is founded is old and much mutilated, it differs so much from all described genera that I have not hesitated to form a new one for it. It bears a striking resemblance to a small *Tipula*, and should probably be placed near *Siphlurus* and *Hexagenia*.

D. tipuliformis, sp. nov.

♂ imago. Fuscous, with a testaceous tinge above, pale yellow beneath; head black between the ocelli; hinder lobes of meso- and meta-nota yellow. Legs (all but the anterior mutilated) testaceous. Wings vitreous, with brown veins. Tails blackish? (only basal joints present). Last dorsal segment of abdomen rounded on its margin; the ventral segment supporting the forceps very large, broadly and triangularly excised in front; basal joint of forceps very short, 2nd long and curved; 3rd and 4th very short, the 4th somewhat shorter than the 3rd; penis long and slender, curved upward, furcate at the apex.

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Length of body (without the tails) 11 mm.; expanse of wings 23 mm.; length of anterior wing 10¼ mm., breadth 3 mm.; length of posterior wing about 2¼ mm.

One ♂ in the Leyden Museum; collected by Von Siebold.

Cloëon, Leach.

C. dipterum, L.

Two ♀ imagos from Yokohama (*Pryer*). Not differing from European examples.

PERLIDÆ.

Perla, Geoffroy.

P. tibialis, Pict.

P. tibialis, Pict., Perlides, 217, pl. 18, figs. 6, 7.

This species may be briefly described as having a black head and thorax, bright yellow abdomen, yellow wings, and black legs with yellow tibiæ. Specimens in De Selys' collection and my own agree perfectly with Pictet's description, and with the dimension for the length of body, but only expand to 35 instead of 45 mm., and all are females.

Perla tinctipennis, sp. nov.

Head black in the middle, yellow anteriorly and posteriorly. Pronotum slightly narrower than the head (with the eyes), broader than long, slightly broader anteriorly; the sides straight, with sharp angles, blackish-fuscous with a narrow median impressed yellowish line, the disk coarsely rugose; meso-notum blackish, with yellow spots; abdomen dull ochreous (the whole under surface of the body pale ochreous); tails yellow; egg-valve very narrow, with a triangular excision in the middle; legs yellow, the tibiæ and apex of femora blackish-fuscous; wings long, pale olivaceous or yellowish, with the costal margin more strongly coloured; neuration yellow, the transverse nodal nervure somewhat fuscous and clouded (♀).

Length of body (without the tails) 21 mm.; expanse 70 mm. One of the largest known species, with somewhat the colours of *P. tibialis*.

Yokohama (*Pryer*). One ♀ in Wormald's collection.

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Perla limbata, Pict.

P. limbata, Pict., Perlides, 219, pl. 9, figs. 1 to 5.

I have three examples from Kobé (*Lewis*) agreeing in the main with Pictet's description and figure. The egg-valve of the ♀ is very broad, rounded anteriorly, and extending beyond the margin of the penultimate segment.

Perla niponensis, sp. nov.

Head broadly shining black on the disk, pale yellow on the margins; *only two ocelli*, placed very far behind, with a flat-topped tubercle on each side; antennæ fuscous, the second joint pale yellow. Pronotum much broader than long, the sides nearly straight, anterior angles sharp, the posterior rounded; median raised lines very distinct, and the disk rugose and tuberculate; it is narrowly margined with black, and with a broad central blackish band, leaving the sides greenish-yellow; meso- and meta-nota almost entirely fuscous. Abdomen dull ochreous above, the whole underside of the body pale greenish-yellow; tails yellow; egg-valve very large, triangularly produced anteriorly, but obtuse at the apex, not extending to the margin of the penultimate segment. Legs greenish-yellow; femora and tibiæ externally, and the tarsi wholly, fuscous. Wings uniformly smoky, excepting the costal margin, which is conspicuously pale greenish-yellow; neuration (excepting the costa and sub-costa) blackish-fuscous: the discoidal cell of the posterior wings is shorter and more triangular than is usual.

Length of body (without the tails) 12 mm.; expanse 38 mm.

Two females from Yokohama (*Pryer*) in Wormald's collection.

Perla lugubris, sp. nov.

Head and thorax wholly dull black above and beneath; ocelli reddish; eyes brown; an oblique flat elongate tubercle on each side of the disk; antennæ brownish in the basal half, afterwards black. Pronotum slightly broader than long, the sides straight; disk coarsely rugose. Abdomen grey, with a yellowish tinge, the tails concolorous. Wings uniformly smoky, with strong black neuration; the area between the sub-costa and radius in the anterior pair dark fuscous; this pair very elongate and narrow, and

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the apical portion of the posterior pair is also narrowed. Legs uniformly blackish-fuscous.

Length of body (without the tails) 19 mm.; expanse 56 mm.

One ♂ from Kobé (*Lewis*) in my collection.

I have a ♀ (from Kobé) that may belong here, but it is scarcely probable; it has the same forms and colours for the head, thorax and legs; the abdomen is castaneous, blackish in the basal portion above; the egg-valve very small, consisting of only a narrow truncated production of the median portion of the margin of the segment; the wings are browner, with the costal margin distinctly pale, and the apical portion of the posterior wings broader.

I have yet three other species of *Perla* (each possessing only two ocelli) from Japan, but think it prudent not to describe them until more materials are before me. Neither of them will accord with the description of the following, which remains unknown to me.

P. geniculata, Pict.

P. geniculata, Pict., Perlides, 232, pl. 21, figs. 1, 2.

Communicated to Pictet, by De Haan, as coming from Japan.

SIALIDÆ.

Neuromus, Rambur.

N. grandis, Thunberg.

Hemerobius grandis, Thbg., Nov. Ins. Sp., pt. 1, 28, fig. 44.

In De Selys' collection and my own.

Since the publication of my paper on the species of *Chauliodes* and allies, in the "Annals and Magazine of Natural History" (July 1869), I have received a ♂ of the true Japanese *N. grandis*, and am now not sure that the Chinese *Hermes costalis* and *H. anticus* of Walker are specifically the same, although these two are identical. Putting on one side certain colour differences, the anal parts have a different appearance. In the ♂ of *N. grandis* the superior appendages are excised at the apex, and produced into a spine at the inner angle; in *costalis* (of which *anticus* is the ♀) they appear to be shorter and obtuse; in the Himalayan *N. infectus*, M'Lach., they are extremely long, and narrowly lanceolate.

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CHAULIODES, Latreille.

C. japonicus, M'Lach.

C. japonicus, M'Lach., Journ. Linn. Soc., Zool. ix, 232.

Yokohama (*Pryer*), in Wormald's collection; also in my own and in that of De Selys, from uncertain localities.

The individual taken by Mr. Pryer is rather larger than those previously seen by me (expanse 105 mm.); I have not yet seen the ♂, but the ♀ has the antennæ (mutilated in other examples) obtusely serrate within up to the apex, each joint being triangularly dilated internally.

SIALIS, Latreille.

S. ——, sp. nov.?

Kobé (*Lewis*); Yokohama (*Pryer*); also in De Selys' collection.

Without seeing examples of the ♂ in better condition (or in alcohol) I cannot venture to say whether this be, or be not, distinct from the Siberian *S. sibirica*, M'Lach. The species of *Sialis* can only be satisfactorily determined from an examination of the anal parts of the ♂.

RAPHIDIIDÆ.

INOCELLIA, Schneider.

I. crassicornis, Schummel.

One pair (♂ ♀) from Yokohama (*Pryer*), in Wormald's collection.

I have compared these with others from Europe and Eastern Siberia without discovering any difference that appear to be specific; but it is desirable that more be examined, and, if possible, individuals in alcohol.

MYRMELEONIDÆ.

ACANTHACLISIS, Rambur.

A. japonica (Hagen), sp. nov.

Greyish-fuscous, clothed with whitish-grey pilosity. Antennæ fuscous, with narrow testaceous annulations. Face, and two basal joints of antennæ beneath, yellow. Pronotum varied with yellow, the anterior margin forming two rounded lobes, the disk deeply bi-impressed trans-

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versely, rather narrower in front than behind. Breast and legs with dense hoary pilosity; femora reddish, becoming piceous at the tips; tibiæ yellow, the anterior and intermediate annulated with black; spurs geniculate, but not strongly so. Wings semi-vitreous, with slight fuscescent clouds; neuration yellow, strongly streaked and spotted with black; pterostigma opaque, greyish-yellow, marked with fuscous internally: in the anterior wings the costal area is occupied by two regular rows of pentagonal cellules, whereof those of the upper row are slightly smaller than the lower, the first seven or eight basal cellules simple. The abdomen of the ♂ terminated by a pair of short, broadly oval, blackish appendages, densely clothed with long black spiniform hairs turned inwards (♂).

Length of body 45 mm.; expanse 110 mm.

I have a ♂ without any indication of special locality. No doubt it is the same as the species recorded (but not described) by Hagen under the above name. He queries it as perhaps identical with the Spanish *A. bœtica*, Rbr., a species practically unknown to me, but I doubt not that, although allied, the two are distinct.

Glenurus, Hagen.

G. japonicus, M'Lach.

G. (?) *japonicus*, M'Lach., Journ. Linn. Soc., Zool. ix, 248.

This pretty species—readily distinguishable by the oblique, semi-lunate, dark mark on the middle of the inner margin of the anterior wings, and the short, broad, dark streak near the apex of the posterior—appears to be common, and comes in all collections from Japan.

Formicaleo, Brauer.

Formicaleo contubernalis, sp. nov.

Body black. Antennæ (mutilated), with the two basal joints yellow. Face and palpi wholly pale yellow; vertex swollen, with numerous small orange-yellow spots. Pronotum longer than broad, scarcely narrower in front, with a deeply impressed transverse line anteriorly, and a broad, concave space posteriorly; marked with orange-yellow spots irregularly arranged in three distant longitudinal rows; an indication of the two lateral rows is to be seen

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on the meso-notum, and there is a short line on the scutellum of this segment; the meta-notum has a semicircular orange-yellow marking, and a median line on its scutellum (or hinder lobe). Abdomen black, the posterior margin of most of the segments narrowly yellow; this colour broadest on the terminal segments, upon which it is continued all round the margin, and, in addition, there is also on those segments a ventrally lateral yellow longitudinal line; the 2nd and 3rd segments have a narrow, interrupted, dorsal orange-yellow line, and the sides of the 3rd have like-coloured spots. Legs yellowish, with numerous small black spots, the anterior and intermediate tibiæ with two black semi-annulations externally; tarsal joints blackish at the apex; hairs long and whitish; spurs testaceous, slightly exceeding the four basal joints of the tarsi; claws testaceous, strongly curved downward. Wings elongate, the posterior narrower and more acute; vitreous with a small blackish point near the termination of the cubiti on the anterior pair; pterostigma whitish, indistinct; neuration mostly black, interrupted with whitish, the sub-costa and radius with strongly marked black and yellowish alternate spaces; gradate veinlets wholly black, costal veins wholly pale.

Length of body 34 mm.; expanse 80 mm. Greatest breadth of anterior wing 9 mm., of posterior 7½ mm.

In De Selys' collection and in my own.

An inconspicuous species.

MYRMELEON, Linné (restricted).

M. formicarius, L. (= *formicalynx*, Burm. et auct.)

One example from Yokohama (*Pryer*), in Wormald's collection. It is of large size (expanse 80 mm.), but differs in no way from European examples. The species is spread over the whole of Europe, and through Central and Northern Asia to Japan. I have it from East Siberia and North China.

M. micans, sp. nov.

Head and thorax blackish above, vertex with an impressed yellowish median longitudinal line, continued as a yellowish line on the pronotum; the latter short, also yellowish on the anterior angles and slightly on the lateral edges; antennæ rather long, deep black; clypeus and labrum

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pale yellow, as is also the whole of the breast, the dark dorsal and pale pectoral colours of the thoracic segments very sharply defined when the insect is viewed laterally. Legs concolorous with the breast, with black spines; all the tarsi dark brown or blackish, and there is sometimes a fuscous line on the posterior tibiæ internally: spurs rather longer than the first tarsal joint. Abdomen greyish-brown, paler beneath, clothed with pale-brownish or yellowish hairs. Wings vitreous, nearly colourless, but very highly iridescent; pterostigma whitish; neuration fine, pale, with short blackish ciliations: anterior pair rather broad, considerably dilated beyond the middle, but in a gradual manner, the extreme apex sub-acute; posterior pair narrower, scarcely shorter, the apex much more slender and acute.

Length of body 32—35 mm.; expanse 81—90 mm. Greatest breadth of anterior wing 12—13 mm., of posterior wing 10—11 mm.

In De Selys' collection and my own; also in Wormald's (Yokohama, *Pryer*), and in the Leyden Museum (*Von Siebold*).

ASCALAPHIDÆ.

Ascalaphus, Fab. (restricted).

A. Ramburi, sp. nov.

Black; front clothed with greyish hairs, as are also the sides of the abdomen, otherwise the clothing is blackish; a yellow crescentiform mark below the basal joint of each antenna frontally, and the facial eye-margins broadly yellow. Prothorax with a raised yellow spot on each side. Meso-thorax with ten yellow spots above, and a divided one on each side below the wings. Legs orange-yellow; the basal half of the femora, the tibiæ at their tips, and all the tarsi, deep black. Anterior wings vitreous, with black neuration, and a small brown pterostigma; at the extreme base the costal and inner margins are pale sulphur-yellow, the intermediate portion of the base fuscescent. Posterior wings not much dilated on the lower margin; smoky brown, with pale centres to many of the cellules, the basal portion shining blackish to the anal angle; costal area towards the base pale yellow, with a brown pupil in each of the cellules, the sector and its

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branches, and many of the nervules starting from it, margined with pale yellow; the region of the cubiti is occupied by a rich yellow streak, deeply furcate from the point where the lower cubitus divides, many of the nervules between the branches of the fork being margined with the same colour: pterostigma darker brown (♀).

Length of body 23 mm.; expanse 59 mm. Greatest breadth of posterior wing 9 mm.

One ♀ in the Leyden Museum; collected by Von Siebold, forwarded to me with the name (in MS.) here retained.

A true *Ascalaphus*, in form resembling *A. sibiricus*, Ev., but differing greatly in coloration. The individual before me appears to be highly mature, so that, in all probability, the posterior wings in less adult examples will be found to be less darkly coloured.

Hybris, Lefebvre.

H. subjacens, Walker.

Ascal. subjacens, Walk., Cat. Brit. Mus., Neurop. 431; *H. subjacens*, M'Lach., Journ. Linn. Soc., Zool. xi. 267; *A. remotus*, Walk., *l. c.* 447.

In all collections received from Japan, and apparently common. Occurs also in North China and the Island of Formosa.

The amount of tinting of the wings varies considerably, probably according to degrees of maturity. Sometimes the wings are wholly vitreous (always excepting the large black pterostigma), or they may be vitreous with the post-stigmatical area smoky, or wholly pale smoky-brown.

The type of *A. remotus*, Walker, placed by him in the division of *Ascalaphidæ* in which the eyes are entire, is only an example of this species with one division of the eyes removed.

MANTISPIDÆ.

Mantispa, Illiger.

M. japonica, sp. nov.

Head yellow, with a black line down the face; antennæ fuscous, the basal joints fuscous; sub-moniliform, with about 30 joints; palpi reddish, the terminal joint piceous at the apex. Prothorax long, dark brown, the dilated anterior portion black, with two yellow spots, forming a

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nearly continuous transverse band; a little behind the anterior portion are two yellow tubercles, the remaining portion finely corrugate. Meso- and meta-thorax varied with yellow, black, and brown. Abdomen much thickened at the apex, yellow above, with an irregular central brown band; beneath blackish, varied with yellow; in the ♂ there are two short, stout, and obtuse lateral appendages, and a large boat-shaped lobe from the middle of the last ventral segment, from within which proceeds the spiniform penis, which is strongly curved, and annulated with black and testaceous. Legs yellowish; posterior tibiæ marked with brownish externally, and the tarsi are brownish; anterior raptorial femora deep black internally, strongly toothed, the basal spine very long. Wings vitreous; neuration black; costa and radius pale; pterostigma very long and narrow, blood red; 7—8 costal nervules in the anterior wings, and about 12 discal cellules, the greater part of which are narrowed in the middle through the bending of the nervules.

Expanse 29 mm.

One ♂ from Yokohama (*Pryer*), in Wormald's collection.

HEMEROBIIDÆ.

Hemerobius, Linné.

H. ——, sp.?

One male from Kobé (*Lewis*), much resembling *H. humuli*, but larger; the anal appendages deeply furcate.

OSMYLIDÆ.

Osmylus, Latreille.

O. flavicornis, sp. nov.

Antennæ yellow, with rather long concolorous hairs, the extreme apex blackish. Head black; the ocelli yellow, and surrounded by the same colour. Pronotum yellow, with three black spots placed in a triangle, the sides with blackish hairs. Meso- and meta-nota yellow, spotted with black. Abdomen blackish, spotted with yellow. Legs yellow; claws simple, very strongly curved. Anterior wings not very broad, sub-acute at the apex, vitreous with black veins; pterostigma with thickened dark-brown

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veinlets on each side; one or two minute basal spots, one or two in the middle, and a large one beyond the middle (formed of two or three smaller spots), all dark brown or fuscous; the inner margin clouded with greyish-testaceous, and many of the discal veinlets margined with the same colour; all the costal veinlets simple; the sector with about 13 branches; the two series of gradate veinlets rather irregular and scarcely parallel; in the posterior wings the dark spots are absent, excepting that at the pterostigma.

Expanse 34 mm.

One example from Yokohama (*Pryer*), in Wormald's collection.

O. tessellatus, sp. nov.

Black, with grey pubescence. Head much swollen above; the ocelli minute, yellow, and there is a yellow ring at the base of the antennæ; face yellow, with a furcate black mark between the antennæ; a small yellow spot in the middle of the pronotum anteriorly. Legs pale yellow, with concolorous hairs; terminal tarsal joint blackish; claws strongly serrate internally. Anterior wings elongate and broad, vitreous; most of the neuration is black, but partly whitish, the sub-costa and radius yellowish, with black lines; many of the transverse veinlets are broadly margined with dark grey, giving the wings a chequered appearance; the inner marginal and apical area clouded with grey in an irregular manner, causing pale and dark spaces; some darker (almost blackish) spots at the pterostigma and on the disk; costal veinlets mostly simple; sector with 15—16 branches; the series of gradate veinlets very irregular, many of those in the outer series absent. Posterior wings with dark marks at the pterostigma, the inner marginal area clouded with pale grey.

Expanse 52 mm.

One example from Yokohama (*Pryer*), in Wormald's collection.

O. Pryeri, sp. nov.

Head and thorax yellowish-grey; clypeus and labrum yellowish; upper part of face and front of vertex shining black, and the margin of the vertex and of the pronotum is black; the pronotum with long black hairs at the

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sides; lobes of the meso-notum much swollen, and deep black; meta-notum almost wholly black. Abdomen black, with pale hairs. Legs yellow, with pale hairs; terminal joint of the tarsi black; claws serrate internally. Anterior wings acute at the apex, pale greyish-fuscous; neuration blackish, excepting the sub-costa and radius, which are yellowish; the cubital discal region and pterostigma with darker fuscous spots, those in the former position forming an ill-defined irregular line running into the apex, and bordering the inner marginal area, which is almost uniformly greyish-fuscous, with a series of whitish spots on the margin; costal veinlets mostly simple; sector with about thirteen branches; the two series of gradate veinlets complete and nearly parallel. Posterior wings paler, subhyaline, without markings, except the brown pterostigma.

Expanse 52 mm.

One example from Yokohama (*Pryer*), in Wormald's collection.

O. hyalinatus, sp. nov.

Head yellow; colours changed in dry individuals (but bright yellow in one that had been in alcohol); antennæ black. Pronotum black, varied with yellow. Abdomen brown, with pale hairs, yellowish at the apex. Legs pale yellow, with concolorous hairs; claws simple. Anterior wings broad, subacute at the apex, subhyaline, with a greyish tinge, highly iridescent; neuration black, but the subcosta and radius yellowish; as a rule without spots, but occasionally there is a small dark discal point, and another on the outer series of gradate veinlets; inner marginal area sometimes slightly clouded; pterostigma brownish; all the costal veinlets (excepting those at the base) are furcate, and almost invariably several of them towards the base are united by a little cross veinlet, forming, in these cases, double cellules; sector with 11—13 branches; the two series of gradate veinlets complete and nearly parallel. Posterior wings without markings, excepting the brown pterostigma.

Expanse 45—50 mm.

Yokohama (*Pryer*); Kobé (*Lewis*). Several examples. In form this more resembles the European *O. chrysops* than do the other species.

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CHRYSOPIDÆ.

Chrysopa, Leach.

C. bipunctata, Burm.

C. bipunctata, Burm., Handb. 982; Schneider, Mon. Chrysop. 103, tab. 31.

I have seen nothing from Japan with which Schneider's words, "*stria arcuata ante antennas*," will agree; but see remarks on next species.

C. cognata, M'Lach.

C. cognata, M'Lach., Journ. Linn. Soc., Zool. ix., 249.

Probably common; found also in China and Cambodia. In one example from Japan there is a spot between the antennæ (absent in all the others), and it thus shows an approach to *C. bipunctata*; but in no individual is there any trace of black spots or streaks *before* the antennæ. The species is closely allied to the European *C. 7-punctata*, and (with *bipunctata*) may be only a local condition thereof.

C. microcephala, Brauer (?).

One individual from Yokohama (*Pryer*), in Wormald's collection, may possibly be this species, which is very near the abundant and widely-spread *C. vulgaris*, if indeed it be not a condition of that insect.

Nothochrysa, M'Lach.

N. japonica, sp. nov.

Head and two basal joints of antennæ yellow, the rest of the antennæ deep black. Pronotum broader than long, with a deep, impressed, longitudinal line in the middle; yellow, tinged with reddish. Meso- and meta-nota yellow, with large black spots at the sides; the sides of the thorax, below the wings, varied with black and yellow in a maculose manner. Abdomen yellow above, with a broad black dorsal line; beneath black, with narrow yellow margins to the segments, and the apex yellow. Wings narrow and elongate, subacute, nearly colourless (probably greenish-yellow in life); neuration mostly yellowish (green?); the lower half of the apical veinlets towards the base in the anterior wings, and the apical half of the sector in both

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pairs of wings, dusky; pterostigma long and narrow, brownish; in the anterior wings the upper half of the 3rd cubital cellule is narrower, the dividing veinlet somewhat oblique; 15—16 nervules between the radius and the sector; the two series of gradate veinlets nearly parallel.

One example in the Leyden Museum; captured by Von Siebold. A pretty and strikingly-marked species.

Expanse 37 mm.

PANORPIDÆ.

Panorpa, Linn.

Notwithstanding that the species of this genus already known from Japan are both numerous and handsome, we are (as I have stated in the introductory remarks) probably only acquainted with a small proportion of those that exist. In 1867, in the Journal of the Linnean Society, Zoology, vol. ix. pp. 256—258, I enumerated five species; since then others have been discovered. They appear to constitute a group (extending into North China and Amur Land), one of the peculiarities of which consists in the fact that the sub-costa in all the wings scarcely extends beyond the middle of the costal margin, a peculiarity only to be found in one true European species (*P. alpina*), which otherwise has no intimate connection with the Japanese group. I propose to describe all the species, as an incentive to resident entomologists in Japan to extend our knowledge of the genus.

P. japonica, Thunberg.

P. japonica, Thbg., Nov. Ins. Sp. Dissert., iii. 67, fig. 9; Dissert. Acad. Upsal., iii. 187, tab. ix. figs. 15, 16; Klug (*Panorp.*), Abhand. Akad. Wissenschaf. Berlin, 1836—1838, 106; Burm., Handb., 957; M'Lach., Journ. Linn. Soc., Zool. ix., 256.

Body totally deep black (in the ♀ with reddish membranous lateral abdominal lines and sometimes with pale margins to the segments); the legs pale, with fuscescent femora. Wings broad, whitish, with black veins; a very broad black fascia rather beyond the middle, and the apex also very broadly black, this space somewhat sinuate internally; occasionally there are two or three small black spots before the fascia. In the ♀ the spots before the

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fascia are always present, and sometimes united into a narrow basal fascia, oblique in a direction contrary to that of the broad fascia, and this latter is usually furcate externally on its lower portion, forming a narrow branch, enclosing a vitreous space, or this branch is reduced to a small marginal spot. In the ♂ the posterior margin of the 3rd dorsal segment of the abdomen is produced into a short broad median lobe (usually concealing a tubercle on the surface and the 4th segment), fringed on each side with pale hairs; 6th and 7th segments stout, cylindrical, equal in length, the 7th slightly less thick than the 6th; 8th slightly longer than the 7th, cylindrical, but thinner and gradually incrassate from the base to the obliquely truncate apex, the cheliferous terminal segment short, but its claws long, piceous or reddish, the appendages that lie on its upper surface short and small, not extending to the base of the claws.*

Expanse 35—39 mm.

Probably of general distribution in Japan. I have a ♀ from North China that appears to be the same species.

P. macrogaster, M'Lach.

P. macrogaster, M'Lach., Journ. Linn. Soc., Zool. ix. 257.

Dull black, the incisures of the abdominal segments, lateral membranous lines, and wing-shoulders, reddish. Legs yellowish or reddish. Wings broad, whitish, with black veins; a broad blackish fascia beyond the middle, traversed longitudinally by a pale line between each of the veins, with a narrow external branch on the inner margin (or a short, narrow, disconnected line); apex broadly blackish, also with pale lines divided by the transverse veinlets, so that it appears fenestrate; two to four blackish basal spots before the fascia. In the ♂ the posterior margin of the 3rd dorsal segment is produced in the middle into a short broad lobe, and there is a tubercle on the surface of the 4th; 6th and 7th, much as in *P. japonica*, but the posterior angles (especially of the 7th) are more produced, forming a triangular tooth; 8th much longer

* The descriptions in the Journ. Linn. Soc. were based upon the, as I now believe, erroneous assumption that the abdomen of *Panorpa* (♂) consisted of eight segments instead of nine.

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than the 7th, and very much thinner, gradually (but slightly) incrassate to the apex, which is oblique and truncate; cheliferous segment apparently as in *P. japonica.*

Expanse 34—41 mm. The only ♀ is much smaller, and has an expanse of only 30 mm.

Hakodaté; in my own collection. In some examples the pale lines in the fascia and apex are less distinct.

P. Klugi, M'Lach.

P. Klugii, M'Lach., Journ. Linn. Soc., Zool. ix. 256.

Varying from testaceous to piceous according to degree of maturity. Head and front of thorax blackish; rostrum reddish. Legs testaceous or reddish. Wings rather narrow, apex rounded; tinged with yellowish or testaceous; a narrow black fascia beyond the middle, and a broad black apical space, both with sharply defined edges, one (sometimes two) small spot before the fascia, and frequently with a small spot on the inner margin between the fascia and the apical portion (in the ♀ these spots are sometimes larger and much more distinct). In the ♂ the posterior margin of the 3rd segment is produced in the middle into a short broad lobe, and there is a tubercle on the surface of the 4th (frequently concealed by the median production of the 3rd); 6th and 7th stout, cylindrical, truncate, the posterior angles not produced, the 7th slightly thinner than the 6th; 8th longer than the 7th, cylindrical, gradually incrassate to the obliquely truncate apex; cheliferous segment larger in proportion than in the preceding species; the claws very long and slender, much curved, and crossing each other in the middle; appendages linear and slender, much curved, widely divaricate from the point where they divide into two branches from the basal piece.

Expanse 27—30 mm.

Yokohama (*Pryer*), Kobé (*Lewis*), and probably from other localities. Apparently common.

P. amurensis, M'Lach., from Amur Land, is an allied, but, as I think, certainly distinct species, differing in the basal spots on the wings being larger and more numerous, and also in structural characters, though only in degree.

P. Pryeri, sp. nov.

Deep black; the cheliferous segment testaceous, with the claws tipped with black; rostrum pale at the sides. Legs dusky testaceous, very pubescent; the tibiæ and

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tarsi somewhat fuscescent. Wings more elongate, and the apex more elliptical than in the preceding species; the posterior pair more dilated in the middle; whitish, with deep black markings as follows:—in the basal portion are three narrow longitudinal lines, viz., one on the costa (broader than the others), and ending in a connected (or isolated) spot; one in the middle, oblique, and extending to the inner margin at the base of the fascia; one on the inner margin (absent in the posterior wings, but there is a spot in its place); a narrow, oblique fascia beyond the middle, and a small apical space (enclosing a pale spot), also two small curved lines on the inner margin, between the fascia and the apex; veins black. In the ♂ there is the usual broad median production of the posterior margin of the 3rd segment; 7th and 8th segments very short, the 7th deeply excised on its apical margin above, the 8th broadly conical; cheliferous segment large, as long as the 7th and 8th united; claws short; appendages apparently very broad and nearly truncate.

Expanse 35—36 mm.

One pair (♂ ♀, which do not vary) from Yokohama (*Pryer*), in Wormald's collection, and a ♀ from Hakodaté, in the British Museum. This latter has the markings of the wings rather less emphasized.

P. Wormaldi, sp. nov.

Black; the sides of the rostrum pale. Legs yellowish. Wings narrow and elongate, with elliptical apex, whitish, with blackish (not deep black) markings as follows:—the costal margin with a streak from base to apex, and a small connected spot before the first fascia; the inner margin also with a streak in which are three pale spots; beyond the middle of the wing are two very narrow fasciæ, each starting from the costal streak, and each broadly furcate in its lower half; beyond the second fascia is a simple linear fascia, and the apical dark portion is also very narrow.

Expanse 29 mm.

One ♀ from Yokohama (*Pryer*), in Wormald's collection.

P. leucoptera, Uhler.

P. leucoptera, Uhler, Proc. Ac. Nat. Sci. Philad. 1858, 31.

The following is a reproduction of the original description:—

"♀. Head black above, testaceous upon the antennal

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region; rostrum dark testaceous, with a black line each side; palpi testaceous, with a piceous tip; antennæ dusky; eyes black, with the posterior lobe testaceous; thorax pale testaceous, a little blackish upon the prothorax; mesothorax with an irregular black superior margin, with which four spots of the same colour are connected against the origin of the wings; wings lactaceous, costal nervule black, discoidal, and most of the transverse nervules whitish, apical longitudinal nervules brown; three pale brown spots upon the subcostal areole, two of which are enclosed within it, one at the origin, the other in the middle, the third runs from the parostigmal areole to the middle of the wing; several small transverse spots are found near the posterior margin, and a large one near the apex; legs testaceous, origins of the tarsal joints and nails blackish; abdomen dull testaceous, the three basal articles and apices of the two next blackish, and appendages dusky."

"Hakodadi."

"Length to tip of abdomen 7½ lines; alar. expanse 14½ lines."

This species is unknown to me; my former indication that I had seen a specimen was based upon an incorrect supposition.

P. ——, sp. nov.

Wings black, with white spots ("Mit ganz schwarzen, weiss gefleckten Flügeln").

Indicated by Hagen (Stett. ent. Zeit. 1867, p. 90) as received by him from the Leyden Museum. It is not in the collection forwarded to me from Leyden, and is quite unknown to me.

LEPTOPANORPA, gen. nov.

Differs from *Panorpa* by the extreme slenderness of all its parts; the wings very narrow; the rostrum exceedingly long; the three terminal segments of the ♂ abdomen immensely long, and almost thread-like, the cheliferous segment being provided with a very long footstalk; the basal (unmodified) segments long (not transverse as in *Panorpa*).

L. Ritsemæ, sp. nov.

Testaceous, the head blackish (excepting posteriorly), and with a black median line along the thorax (in the ♀

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the head and thorax are nearly wholly blackish above). Legs yellowish; wings with a slight testaceous tinge, and with fuscous veins; there is a very narrow pale fuscous fascia beyond the middle, expanding on the costa, where it forms the inner side of the pterostigma (in the posterior wings this fascia is abbreviated or interrupted), and (in the ♀) two or three small basal spots; posterior edge of the 5th abdominal segment in the ♂ blackish; terminal segments yellowish; 6th and 7th segments each nearly as long as all the basal segments united; the apical portion gradually incrassate; footstalk of the cheliferous segment scarcely shorter and of the same form; its apex considerably dilated, so that the basal portion (before the claws) is somewhat pyriform; claws long, strongly curved and crossing; appendages very long and slender, extending beyond the base of the claws. (In the ♀ the terminal segments of the abdomen are very slender.)

Total length of body of ♂ about 25 mm.; expanse 25 mm.

One pair (♂, ♀) in the Leyden Museum; captured by Von Siebold.

L. Sieboldi, sp. nov.

Head deep black, pale posteriorly; rostrum piceous, with pale sides. Thorax piceous in front, testaceous posteriorly, wholly yellow beneath. Abdomen fuscescent. Legs yellow. Wings with a slight greyish tinge, and with fuscous veins; the only marking is a rather broad pale fuliginous apical space, straight internally (♀).

Expanse 24 mm.

Two females in the Leyden Museum; captured by Von Siebold.

An approach towards the abdominal formation in the ♂ of *Leptopanorpa* is to be found in *P. nematogaster*, M'Lach., from Java (perhaps also in *P. Charpentieri*, Burm.), but in it the cheliferous terminal segment is sessile. The genus very clearly shows that the abdomen in the *Panorpidæ* has nine segments; for the 1st segment, ordinarily confused with the hinder portion of the metathorax, is here very long.

PANORPODES, gen. nov.

General form much as in *Panorpa*. In the ♂ the abdomen is short; all the segments (excepting the terminal

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one) are narrow and transverse, the 8th especially so, and not modified; the cheliferous segment ordinary, sessile, the claws short and stout. In the anterior wings the sub-costa extends into the pterostigmatical space, in the posterior it is abbreviated; the wings without dark markings. The rostrum very short, triangular; maxillary palpi having the 3rd and 4th joints very much dilated, and concave within, 2nd and 5th thin, 1st very short, the others longer and subequal; maxillary lobes narrow, but the inner broader than the outer, and furnished with a crest of cilia at the tip; labial palpi with the joints short and not dilated, but the 2nd slightly clavate; labrum (rostrum) with a deep triangular notch at the apex. Tarsal claws simple (not serrate), strongly curved.

This genus is, in many respects, intermediate between *Panorpa* and *Euphania* (Westw.). By its very short rostrum and narrow and unmodified penultimate and ante-penultimate male segments it approaches the latter, while in the form of the wings and in the composition of the cheliferous segment it is more allied to *Panorpa*. In *Euphania* the costal area of the wings is broadly dilated and the cheliferous segment bears only modified claws, the whole segment being considerably different in structure from that of *Panorpa*. As heretofore, I am inclined to consider *Euphania* identical with *Chorista* (Klug), though Klug neither describes nor figures the dilated costal area. If *C. australis* be not *E. luteola*, then it is some insect that has not since been observed: and I must admit that the details of the mouth-parts of *C. australis*, as given by Klug, do not agree with those of *E. luteola*, in which the maxillary palpi have the 3rd and 4th joints very much dilated, as in *Panorpodes*; but in *E. ruficeps* (Newm.) these palpi are formed much in the manner as indicated for *Chorista*, still, however, with the characteristic dilatation of the costal area in the wings.

P. paradoxa, sp. nov.

Testaceous. Head shining-black between the ocelli; antennæ fuscescent, excepting at the base. Legs testaceous. Wings wholly pale yellowish, shining, without markings, only that the pterostigmatic region is more opaque and finely granulose; veins pale fuscous, the transverse veinlets nearly transparent and almost colourless.

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Claws of the terminal segment (of ♂) reddish at the tips, and with a tuft of pale hairs internally near the base; appendages laterally very broad, concave internally, crossing at the tips, where there is a minute black second joint (♂).

Length of body 9 mm.; expanse 31 mm.

Two males from Yokohama (*Pryer*), in Wormald's collection.

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XII. *Descriptions of new* Coleoptera *from Australia.*

By Chas. O. Waterhouse.

[Read 5th July, 1875.]

Having recently been engaged in naming a series of Coleoptera, added to the British Museum Collection from Port Bowen, I have noted a large number of new species and some new genera. This paper contains as many descriptions as I have been able to prepare up to the present time.

NECROPHAGA.

Cucujidæ.

Ino dimidiatus, sp. nov.

Depressus, nitidissimus, flavo-testaceus; capite, thorace elytrorumque apice nigris; antennis piceis. Capite sat crebre punctulato. Thorace capite haud latiori, discrete subtilius punctulato, ante medium lateribus bene rotundatis, postice fortiter angustato. Elytris capite thoraceque conjunctis paulo longioribus, basi angustatis, parce subtilissime punctulatis, singulo elytro ad apicem rotundato. Abdomine apice rotundato, subtilissime punctulato.

Long. 2⅛ lin.; lat. 1 lin.

Head large, slightly narrowed behind the eyes, distinctly and not very thickly punctured; labrum yellow. Antennæ pitchy, a little longer than the head and thorax. The elytra are scarcely longer than the head and thorax taken together, very broad behind, at the base a little narrower than the broadest part of the thorax; very sparingly punctured, the apical half black, the apex of each elytron rounded, especially on the outer side. The punctuation of the abdomen is very delicate, not very thick on the basal segments, but closer on the apical one. The anterior femora are pitchy.

Hab.—Port Bowen. B. M.

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LAMELLICORNIA.

MELOLONTHIDÆ.

Epholcis, gen. nov.

Mentum quadrangular, a little longer than broad; a little broader in front, concave on the exposed surface. Labial palpi with the apical joint conical. Maxilla with the apical lobe with five or six strong, sharp teeth. Basal joint of the maxillary palpi minute; the other three elongate, subequal. Clypeus trapezoidal, anterior margin with a deep central incision. Antennæ 9-jointed; basal joint club-shaped, 2nd globular, 3rd and 4th joints subcylindrical, 5th joint a little shorter than broad, 6th very transverse, 7th, 8th and 9th forming an ovate club. Thorax below excavated to receive the head; the lateral margins of the excavation curved. Claw joint of the anterior tarsi nearly as long as the three preceding joints taken together; claws slender and curved, each claw furnished, at its extreme base, with a small quill-like appendage.

This insect has the appearance of *Mœchidius*, with the head resembling that of *Diphucephala*. It should be placed between these two genera. The lateral borders of the excavation on the under side of the thorax in *Mœchidius* are rectilinear behind and emarginate in front; in the present genus the borders are entirely curved.

Epholcis divergens, sp. nov.

Elongata, picea, subopaca. Capite magno, vix crebre haud fortiter punctato; clypeo rufo-piceo, antice angustato, in medio fere ad basin diviso, apice reflexo, lateribus bisinuatis; oculorum cantho prominulo obtusiusculo. Thorace longitudine duplo latiori, leviter convexo, crebre sat fortiter punctato, antice posticeque angustato, lateribus post medium leviter sinuato; angulis anticis prominulis, posticis obtusiusculis (fere rectis). Scutello discrete punctato. Elytris thoracis latitudinem æquantibus, postice paulo ampliatis; striis plurimis e punctis parvis elongatis formatis, punctis setiferis, interstitiis angustissimis.

Long. 4½ lin.; lat. 2 lin.

Pitchy; the forehead, the disk of the thorax and the elytra darker. Head large, the punctures forming irregular, transverse, short lines; the clypeus somewhat re-

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sembles that of some *Diphucephalæ*. It is narrowed in front, with the apex slightly reflexed or thickened, divided in the middle by a deep incision; the ocular canthus is very small, very slightly prominent, and slightly obtuse. The sides of the thorax are somewhat angular behind the middle; the posterior angles are somewhat obtuse. The elytra are closely covered with rows of setiferous punctures,—each puncture has at its base a minute shining tubercle,—the interstices are extremely narrow, except the third, fifth and seventh, which appear as narrow, irregular, shining costæ.

Hab.—Cape York. B. M.

MÆCHIDIUS, MacLeay.

The species of the genus are divisible into two sections: the first having the claws to the tarsi simple (*M. spurius*, Kirby, &c.); the second having a delicate quill-like appendage springing from the extreme base of the claw, and sometimes nearly equalling it in length (*M. atratus*, Burm., &c.). A very similar appendage is seen in the claws of *Pyronota*.

Section I. Claws without basal appendage.

Mæchidius spurius, Kirby.

In the British Museum Collection there is a specimen from Swan River, which differs from the type specimen in having the forehead evenly convex (with no impression on the forehead as in the type); the thorax has the sides behind the middle nearly parallel, whereas in the type the thorax is slightly narrowed behind, the posterior angles are acute in the former, and slightly obtuse in the latter. The minute round tubercles at the base of each puncture on the elytra are very distinct in the type, less so in the Swan River specimen. The apex of the posterior tibia is more produced on the outer side than in any other species with which I am acquainted, the produced part is directed outwards.

Mæchidius latus, sp. nov.

Nigro-piceus, latus, parallelus, depressus. Capite antice sat fortiter triangulariter emarginato, lateribus obliquis bisinuatis, genis prominulis obtusis. Thorace longitudine

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duplo latioribus, crebre fortiter punctato; lateribus arcuatis, pone medium paululo angustatis; basi utrinque fortiter sinuato, angulis posticis bene acutis. Elytris thorace haud latioribus, lateribus fere parallelis, depressis, striato-punctatis, interstitiis alternatis costatis.

Long. 5½ lin.; lat. 3 lin.

This species is peculiar for its broad depressed form. The thorax is very slightly narrowed at the base, the posterior angles are unusually acute, owing to the base of the thorax being strongly sinuate on each side. The elytra have the alternate interstices distinctly costate.

Hab.—Melbourne. B. M.

In the British Museum Collection are several specimens which differ from the above described in having the punctures on the thorax crowded, but in other respects they agree; the difference is possibly only sexual.

Mœchidius variolosus, W. MacLeay.

This species (if I have correctly determined it) is easily distinguished by its clear brown colour, and by the long hair with which it is clothed. In this and the following species the posterior tarsi are long, and the anterior tibiæ scarcely dentate.

Hab.—Sydney. B. M.

Mœchidius longitarsis, sp. nov.

Castaneus, sat nitidus, depressiusculus. Clypeo haud profunde triangulariter exciso. Thorace sat crebre punctato, postice vix angustato, angulis posticis acutiusculis, basi fortiter bisinuato. Tibiis anticis angustis, vix tridentatis. Tarsis posterioribus sat gracilibus, articulo primo elongato duobus sequentibus conjunctis æquali.

Long. 4 lin.; lat. 2⅛ lin.

This species is very close to the preceding. They have in common the castaneous colour, nearly the same form; the anterior tibiæ are unusually little dilated; the apex is only very slightly bifid, and the usual upper third tooth is nearly obsolete. In both species the posterior tibiæ are slender, very slightly produced at the apex; the tarsi are slender, and the basal joint is unusually long (equal to the two following taken together in the present species). The head is rounded at the sides and in front, with the

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clypeus not very deeply triangularly notched in the middle. Thorax gently convex, not very thickly punctured, twice as broad as long, scarcely narrowed behind the middle; the base strongly sinuated at each side; the posterior angles acute, not directed outwards. The elytra are striate-punctate, the alternate interstices very narrow, and, owing to a transverse tubercle at the base of each puncture, the interstices are irregular (in fact, only visible when seen from behind, or not directly from above). There is no long hair on the thorax and elytra as in the preceding species.

Hab.—South Australia. B. M.

Mœchidius rufus, Hope.

Hab.—Australia. Mus. Oxon.

Mœchidius ater, sp. nov.

Oblongus, ater, convexus. Capite antice leviter emarginato, lateribus reflexis vix sinuatis, genis prominulis obtusis. Thorace longitudine $\frac{2}{3}$ latiori, convexo, creberrime fortiter punctato, antice arcuatim angustato, lateribus postice rectis, angulis posticis acutis, basi utrinque leviter sinuato. Elytris thoracis latitudine et $2\frac{1}{4}$ longioribus, parallelis, leviter convexis, striato-punctatis, striis æquidistantibus; punctis oblongis, singulis basi tuberculo rotundato nitido instructis. Antennarum clava magna ovata.

Long. $3\frac{1}{2}$—$4\frac{1}{2}$ lin.; lat. $1\frac{1}{3}$—$2\frac{1}{4}$ lin.

Deep black, convex, sub-opaque. The thorax is only slightly emarginate in front; the sides are arcuate in front, nearly parallel behind; the base is gently emarginate on each side, which makes the posterior angles acute. Elytra the same width as the thorax, parallel at the sides; each puncture of the striæ has a distinct shining tubercle at the base.

Hab.—Sydney. B. M.

Mœchidius brevis, sp. nov.

Præcedenti affinis, at paululo latior. Thorace crebre fortius punctato, angulis posticis denticulo instructis, basi leviter rotundato utrinque leviter sinuato. Elytris basi fere truncatis, latitudine $\frac{1}{3}$ longioribus, postice paulo am-

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pliatis, striarum punctis singulis basi tuberculo minuto instructis.

Long. 3½ lin.; lat. 1⅘ lin.

This species is very close to the preceding. The head is nearly of the same form, but the angle made by the side of the anterior emargination, and the oblique side of the head, is less obtuse; the sides distinctly bisinuate, and the cheeks are very prominent and acute; the minute tubercles on the surface are not crowded as in the preceding. Thorax convex, rather thickly and strongly punctured (crowded at the sides); the sides are evenly rounded, with the margins minutely crenulate; the posterior angles are indicated by a small triangular tooth, behind which the base is gently sinuate. The elytra are about ⅓ longer than their width at their base, the base nearly straight; the punctures forming the rows are elongate and narrow, each puncture with a small, transverse, shining tubercle at the base; the interstices flat, but rendered slightly irregular by the tubercles at the base of the punctures. Pygidium with crowded punctures, and without any raised, central, smooth line. Anterior tibiæ short and broad, with three nearly equal strong teeth on the outer side, equidistant from each other.

Hab.—Rockhampton. B. M.

A specimen from S. Australia (Mount Alexander district) only differs from the above in having the thorax a little broader and the elytra relatively longer.

Long. 4¼ lin.; lat. 2¼ lin.

Mœchidius acutangulus, sp. nov.

Oblongus, convexiusculus, piceus, subopacus. Capite antice triangulariter emarginato, lateribus reflexis obsolete bisinuatis, genis prominulis. Thorace longitudine ⅓ latiori, sat convexo, confertim sat fortiter punctato; angulis anticis sat prominentibus, lateribus fortiter rotundatis, basi omnino rotundato, angulis posticis dente parvo acuto instructis. Scutello elongato-triangulari. Elytris thorace vix latioribus at duplo longioribus, striato-punctatis, punctis elongatis setiferis, interstitiis planis.

Long. 3¼ lin.; lat. 1¾ lin.

The head is not very deeply triangularly emarginate in front; the sides are oblique and reflexed, very slightly bisinuate; the cheeks are slightly prominent and slightly acute. Thorax broadest behind the middle, gently

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narrowed in front, with the sides much rounded; the posterior angles are only indicated by a small acute tooth, behind which the base is very slightly sinuate; the punctures on the surface are small and round, and crowded, each puncture having a minute, round, yellow scale in the centre. Elytra emarginate at the base; the punctures which form the striæ are narrow, and there is a minute tubercle at the base of each puncture; there is the appearance of a slight impressed line on the inner side of the third, fifth and seventh rows of punctures. Pygidium thickly punctured, longitudinally raised in the middle. Anterior tibiæ slightly broader towards the apex, tridentate on the outer side, the basal one small and distant from the other two.

Hab.—Port Bowen. B. M.

Mæchidius excisus, sp. nov.

Elongatus, niger, subopacus. Capite antice leviter emarginato; lateribus obliquis, leviter bisinuatis, reflexis, genis prominulis obtusis. Thorace longitudine $\frac{2}{3}$ latiori, convexo, crebre fortiter punctato; lateribus arcuatis, ante angulos posticos semicirculariter excisis, angulis posticis acutis. Elytris deplanatis, postice paulo latioribus, striato-punctatis, punctis elongatis, interstitiis planis.

Long. $4\frac{1}{2}$ lin.; lat. 2 lin.

Head thickly punctured, in front with a shallow triangular emargination; the angle before the eye is not very prominent, obtuse, but not rounded. The thorax is slightly narrowed in front, thickly (somewhat closely) and strongly punctured; the sides are arcuate, with a small semi-circular emargination before the posterior angles, which are acute and slightly prominent. The anterior tibiæ are stout, wider at the apex, with a small tooth in the middle of the outer edge and two strong approximate teeth at the apex.

Hab.—Port Bowen. B. M.

Mæchidius hopeanus, of Westwood, differs from the above in having the head in front less emarginate, the sides less directly oblique and the cheeks rounded. There is also no distinct angle before the posterior emargination of the side of the thorax, as there is in *M. excisus*. Lastly, the upper tooth on the anterior tibia is much closer to the apical teeth than in the above described insect.

Hab.—Moreton Bay, Clarence River. B. M.

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Section II. Claws with a quill-like appendage at the base of each.

Mœchidius atratus, Burm.

Hab.—Melbourne.

Mœchidius sordidus, Boisd.

This appears to be one of the commonest South Australian species. In Gemminger and Harold's Catalogue, *M. MacLeayanus*, Westw., is sunk as a synonym of it. I have authentic specimens of *M. sordidus* and have seen the type of *M. MacLeayanus*, and can therefore say with certainty that the species are distinct. *M. sordidus* is opaque, brown, oblong, the sides somewhat parallel; the thorax is very slightly narrowed posteriorly, the posterior angles are slightly less than right-angles; the setæ on the surface are rather fine and are all directed towards the scutellum; the striæ of the elytra are equidistant, the interstices flat.

Mœchidius emarginatus, sp. nov.

Oblongus, piceo-niger, subopacus. Capite vix convexo, fortiter punctato, antice emarginato, emarginationis angulis exterioribus acutis prominulis, lateribus obliquis sat fortiter bisinuatis, genis prominulis obtusis. Thorace longitudine $\frac{2}{3}$ latiori, antice arcuatim angustato, leviter convexo, crebre haud fortiter punctato; lateribus crenulatis; angulis posticis oblique semicirculariter emarginatis, angulo ante emarginationem fere recto, angulo postico obtusiusculo. Scutello punctulato. Elytris deplanatis, thorace vix latioribus at $2\frac{1}{2}$ longioribus; striarum punctis elongatis, setiferis, setis plerumque erectis brunneo-testaceis. Pygidio ad apicem foveâ magnâ impresso.

Long. 5 lin.; lat. $2\frac{3}{4}$ lin.

This species is closely allied to the preceding, but is less strongly sculptured; the form of the thorax is moreover quite different. In the preceding species the thorax becomes narrower a little before the posterior emargination, whereas in this species the thorax is broadest at the anterior angle of the emargination. The elongate punctures of the striæ have no tubercle at their base, as in the preceding species.

Hab.—Australia. B. M.

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Mœchidius sexdentatus, sp. nov.

Oblongus, sat convexus, piceus, rugosus. Capite utrinque tridentato. Thorace confertim fortiter rugoso-punctato, convexo, lateribus rotundatis, marginibus crenulatis, angulis posticis sat acutis, basi utrinque sat fortiter sinuato. Elytris thoracis latitudini æqualibus, fortiter striato-punctatis, interstitiis irregularibus alternatim subelevatis nitidis. Tibiis sat latis, fortiter tridentatis; tarsis brevibus.

Long. 3¾ lin.; lat. 1⅘ lin.

Head with the margins reflexed, rather deeply triangularly emarginate in front, the sides with three strong triangular blunt teeth. Thorax very coarsely rugosely punctured, the intervals shining, the sides rounded in front, moderately narrowed behind, the posterior angles are moderately acute (but not directed outwards). The punctures on the elytra are very strong, and the shining tubercles at the base of the punctures encroach upon the interstices so as to make them irregular; three of the interstices are broader than the others and irregularly sub-costiform. The posterior tibiæ are enlarged at the apex.

Hab.—Adelaide.

Mœchidius MacLeayanus, Westw.

Oblongus, subdepressus, nigro-piceus. Capite fortiter crebre punctato, antice emarginato, lateribus obliquis bisinuatis. Thorace transverso, crebre fortiter punctato, antice arcuatim angustato, pone medium paululo angustato; angulis anticis prominulis obtusis, posticis acutiusculis; basi utrinque sinuato. Elytris thorace haud latioribus, postice paulo ampliatis, striato-punctatis (punctis ovatis, singulis basi tuberculo minuto transverso instructis), interstitiis alternatis nitidis.

Long. 4½ lin.; lat. 2⅓ lin.

The anterior margin of the head is not deeply triangularly emarginate; the sides are oblique, distinctly bisinuate, the cheeks rather broad and prominent. The thorax is thickly punctured on the disk, but the punctures are not crowded; the anterior angles are blunt, the sides are gently rounded, more narrowed in front than behind the middle; the base is gently sinuate at each side, which makes the posterior angles slightly acute. The alternate

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interstices of the elytra are slightly less narrow than the others, and more shining.

Hab.—East Australia. B. M.

This species resembles *M. spurius*, Kirby, of the first section, but that has the head in front nearly straight; the cheeks are less prominent, the thorax less strongly transverse, and the sides are not reflexed as they are slightly in *M. MacLeayanus*, and the posterior angles are slightly obtuse angles.

Mœchidius corrosus, sp. nov.

Oblongus, convexus, niger, rugosus. Capite rugoso, antice triangulariter exciso, lateribus bene reflexis obliquis, sat fortiter bisinuatis. Thorace convexo, fortiter creberrime punctato, pone medium parum angustato, lateribus leviter rotundatis, angulis posticis fere rectis; basi medio rotundato utrinque leviter sinuato. Elytris thorace vix latioribus, fortiter punctato-striatis, punctis basi tuberculo transverso nitido, interstitiis 2, 4, 6 paulo latioribus nitidis sat costatis, alteris angustis interruptis.

Long. $5\frac{1}{3}$ lin.; lat. $2\frac{1}{2}$ lin.

This species resembles *M. MacLeayanus*, but is more convex; the sides of the head are much reflexed. The thorax is more convex, the sides are not reflexed towards the front; the posterior angles are nearly rectangles (not at all acute). The sculpture of the elytra is very rugose; the punctures are deeply impressed; the alternate interstices are very narrow, and almost lost between the striæ.

Hab.—Van Diemen's Land. B. M.

Mœchidius gracilis, sp. nov.

Elongatus, rufo-brunneus, opacus, flavo-setosus. Capite sat plano, antice fere truncato, lateribus obliquis, vix bisinuatis, genis angustis. Thorace leviter convexo, longitudine duplo latiori, sat crebre fortiter punctato (punctis flavo-setosis), antice posticeque bene angustato, angulis anticis prominulis acutis, lateribus medio fere angulatis, angulis posticis obtusis; basi utrinque oblique truncato. Elytris thorace paulo latioribus, postice ampliatis, striato-punctatis, punctis elongatis leviter impressis, flavo-setosis; marginibus flavo-ciliatis; singulo elytro lineis tribus haud elevatis obscurioribus. Tibiis anticis tridentatis.

Long. 3 lin.; lat. $1\frac{1}{2}$ lin.

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This species is very unlike all the others in the genus. The thorax is slightly angular at the sides, the elytra are long, and the setæ which are on the surface are very distinct, and bright yellow; each elytron has three distinct dark lines of a slightly purple-brown colour.

Hab.—Sydney. B. M.

Mœchidius obscurus, rugosicollis and *parvulus*, described by MacLeay, and *M. Mellyanus* and *Raddonanus* of Westwood, are unknown to me, so that I cannot say to which section they belong.

Lepidiota squamulata, sp. nov.

Picea, convexa, creberrime albo-squamulata. Capite lato, convexo; clypeo transverso, antice rotundato, in medio reflexo-emarginato. Thorace longitudine fere duplo latiori, convexo, antice angustato, margine antico vix emarginato, basi late bisinuato, angulis posticis rectis. Scutello apice obtuso. Elytris basi thorace haud latioribus, postice rotundato-ampliatis, convexis. Tibiis anticis fortiter tridentatis.

Long. 13½ lin.; lat. 6¾ lin.

Thorax closely covered with round shining scales. The elytra very thickly covered with white scales, but not crowded together as on the thorax. The margins of the pygidium are reflexed.

Hab.—Swan River. B. M.

In the Musuem Collection there is a second specimen, which has the white scales smaller than in the specimen described, and consequently they are less close together.

LEPIDODERMA, gen. nov.

Antennæ with the 3rd and 4th joints elongate and equal; the 5th very transverse; the 6th to 10th forming a short club, the 6th joint not quite as long as the four following joints. No sternal process. Anterior tibiæ armed with three teeth.

This genus belongs to the true *Melolonthidæ* of Lacordaire, but differs in the antennæ from any genus with which I am acquainted. The species described below somewhat resembles *Tricholepis niveopilosa*, Blanch., and I think the genus is best placed immediately after *Lepidiota*.

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Lepidoderma albo-hirtum, sp. nov.

Oblongum, nigrum, dense albo-hirtum. Capite magno; clypeo brevi, antice rotundato, in medio leviter reflexo-exciso. Thorace longitudine duplo latiori, convexo, antice angustato, lateribus rotundatis. Scutello apice rotundato. Elytris basi thorace vix latioribus, postice paulo ampliatis, ad apicem deflexis. Abdomine supra cinereo.

Long. 15 lin.; lat. 7 lin.

Thorax more narrowed in front than behind, the base obliquely truncate at each side, the posterior angles nearly rectangles. The elytra are a trifle more than three times as long as the thorax, not costate, the apex deflexed. Legs black, sparingly covered with long yellowish hair. Head, thorax, elytra, sides of the abdomen and the pygidium densely clothed with white scale-like hair, that on the sides of the abdomen finer. The upper side of the abdomen is clothed with fine ashy pubescence; the metasternum with longer brownish pubescence.

Hab.—Port Bowen. B. M.

SERRICORNIA.

Rhipidocera mystacina, Fab.

The type specimen of this species in the Banksian Collection has the thorax entirely clothed with white pubescence, the abdomen maculate, and the elytra rather roughly sculptured. The specimens from Port Bowen agree perfectly with the type. The common form having the thorax spotted with white, I take to be merely a variety. The number of joints in the antennæ of the ♂ examples from Port Bowen varies from 22 to 34; a ♀ example appears to have 18 joints to one antenna and 19 to the other. Specimens from Swan River, which I suppose to be *R. pumilio*, have black femora; one male example has 43 joints in the antennæ.

Specimens with the abdomen immaculate and with the elytra less densely and less strongly sculptured appear to belong to a distinct species, but I cannot satisfactorily name it from descriptions which I have seen.

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BUPRESTIDÆ.

Chalcotænia elongata, sp. nov.

C. Lamberti affinis. Thorace utrinque foveâ ovatâ subtiliter punctulatâ impresso ; elytris quadricostatis, costâ tertiâ postice abbreviatâ, interstitiis costis latioribus æneis, crebre subtiliter punctatis, ad costæ tertiæ apicem foveâ quadratâ leviter impressâ.

Long. 11 lin.; lat. $3\frac{1}{2}$ lin.

Elongate, olivaceous, shining. Interstices of the elytra coppery at the base. Thorax slightly narrowed in front of the middle, somewhat sparingly and strongly punctured; the impressed suture, a small spot on each side of it near the front, and an oblong shallow fovea close to the margin behind the middle, green; the lateral fovea finely rugulose. Elytra a little broader than the thorax, attenuated towards the apex, with margins towards the apex serrated. Each elytron with four costæ, the third abbreviated, the interstices broader than the costæ and finely punctured and rugulose; at the apex of the abbreviated costa there is an oblong shallow fovea, which is filled with fine white pubescence.

Hab.—Port Bowen. B. M.

Differs from *C. Lamberti* in having only a single fovea at the side of the thorax, in the greater width of the interstices of the elytra, and in the presence of the fovea behind the middle.

Chalcotænia quadrisignata, Saund.

The female of this differs from the male in having the apical segment of the abdomen slightly truncate, the ♂ having a deep triangular emargination. The females appear to be constantly larger than the males; the specimen in the Museum Collection measures 18 lines in length.

Hab.—Port Bowen.

Chalcotænia cuprascens, sp. nov.

Elongata, convexa, nitida, cuprascens. Capite crebre, fronte parce punctatis. Thorace postice longitudine $\frac{1}{3}$ latiori, leviter convexo, antice paulo angustato; disco discrete punctato, longitudinaliter fortiter canaliculato; lateribus crebre punctatis, antice canaliculâ et postice foveâ magnâ rotundatâ subtiliter punctatâ ornatis. Elytris thorace

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paulo latioribus, et 3½ longioribus, lateribus parallelis, postice attenuatis; superne discrete punctatis; singulo elytro foveis tribus magnis et lineis tribus latis haud profundis impresso.

Long. 12½ lin.; lat. 4⅓ lin.

This species is closely allied to *C. australasiæ*, Saund., but has the under side sparingly punctured, except in the lateral fossæ of the abdomen. The foveæ on the thorax and elytra are also different. Thorax narrowed in front, broadest at the posterior angles; the disk somewhat sparingly punctured, with two very shallow foveæ near the anterior margin; sides in front marked with an oblique shallow channel, which runs into a deep round fovea near the posterior angles. Each elytron with two small shallow foveæ at the base, a third on the side below the shoulder, a large round impression on the disk before the middle, a large triangular impression placed obliquely behind the middle near the side; below this last there is an elongate narrow impression reaching nearly to the apex of the elytron; parallel with the suture there is a broad shallow impression, and a second one close to it occupying only the apical half of the elytron. Abdomen sparingly and strongly punctured, except at the sides.

Hab.—Port Bowen. B. M.

Var.—Colour somewhat æneous; abdomen with only a few punctures on the middle portions.

Hab.—North Australia. B. M.

Chalcotænia quadri-impressa, sp. nov.

C. australasiæ affinis. Capite foveâ elongatâ fortiter impresso. Thorace antice paulo angustato, lateribus creberrime rugoso-punctatis, ad angulos posticos impressione haud definitâ. Elytris thorace paulo latioribus, parallelis, postice attenuatis; singulo elytro impressionibus duabus discalibus notato.

Long. 11 lin.; lat. 4¼ lin.

The head has a deep elongate fovea. Thorax gently narrowed from the base to the front; the disk is thickly punctured; on each side of the suture there is an irregular, raised, smooth, black line with one or two raised smooth spots in front; all the punctured portions are bright green; at each posterior angle there is a large, shallow, ill-defined, thickly-punctured impression. The elytra are green, the suture and the costæ blackish and shining; one costa is

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parallel to the margin, a second is somewhat oblique, and runs from the shoulder to the apex of the elytron, a third costa commences at the base close to the suture, and joins the second costa some distance ($\frac{1}{3}$) from the apex; in the discoidal space between these two costæ are two large shallow coppery impressions, linked together by a very short costa; the space next the suture and that between the 1st and 2nd mentioned costæ is impressed and very finely punctured. The abdomen is very thickly punctured, coarsely in the middle, finely at the sides; the apical segment with a distinct triangular incision at the apex.

Hab.—North Australia. B. M.

Chalcotænia occidentalis, sp. nov.

C. australasiæ, Saund. affinis, at latior. Elytris postice abrupte attenuatis; marginibus ad apicem denticulis 6 vel 7 armatis.

Long. 12—14½ lin.; lat. 4¾—5½ lin.

This insect differs from *C. australasiæ*, Saund., in being rather less convex, rather broader, with the surface of the elytra less rough, the spaces between the costæ flat, and very finely punctulate; the margins have only six or seven small teeth at the extreme apex.

Hab.—Nicol Bay, West Australia. B. M.

HETEROMERA.

Atryphodes quadridentatus, sp. nov.

Ater, depressus. Capite planato, fronte utrinque lineâ brevi curvatâ fortiter impressâ. Thorace longitudine paulo angustiori, postice bene angustato, margine antico semicirculariter emarginato; lateribus late reflexis, antice arcuatim-rotundatis, ante angulos posticos in dentem parvum triangularem ampliatis, angulis posticis acute productis; basi leviter emarginato; disco sub-plano, tricanaliculato. Elytris basi thorace haud angustioribus, postice latioribus (lateribus arcuatis), sat fortiter striatis, interstitiis alternatis costatis. Abdomine nitido. Tarsis ferrugineis.

Long. 8 lin.; lat. 3⅓ lin.

This species resembles *A. egerius*, Pascoe, but the curious double posterior angles to the thorax separates it from all its congeners. The second joint of the antennæ is very small, the third is longer than the two following taken together; the fourth to tenth joints become gradually

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shorter and smaller, but the tenth is still not transverse; the apical joints are slightly ferruginous.

Hab.—Port Bowen. B. M.

PHYTOPHAGA.

CHRYSOMELIDÆ.

Diphyllocera striata, sp. nov.

D. gemellatæ affinis. Differt fronte utrinque sulcatâ; thorace antice angustato, cupreo tincto, parce fortiter punctato; elytris fortiter striato-punctatis; femoribus haud piceis.

Long. $5\frac{3}{4}$ lin.

This species closely resembles *D. gemellata*, Westw., but is at once distinguished by the strong striate-punctate elytra, &c. The thorax is transverse, slightly narrowed in front, blackish-purple, the sides and disk with coppery reflections; the scattered punctures on the surface are very strong, the anterior angles are not produced. The elytra are dark olive colour, with the shoulders coppery; the deep impressions, which are golden, are placed nearly as in *D. gemellata*, but the hindmost lateral one is double. There is a transverse curved coppery and golden band near the apex of each elytron, and a second short band at the extreme apex.

Hab.—Port Bowen. B. M.

LIST OF SPECIES.

NECROPHAGA (CUCUJIDÆ).

Ino dimidiatus, sp. nov.

LAMELLICORNIA (MELOLONTHIDÆ).

Epholcis divergens, gen. et sp. nov.
Mæchidius spurius, Kirby.
„ latus, sp. nov.
„ variolosus, W. MacLeay.
„ longitarsis, sp. nov.
„ rufus, Hope.
„ ater, sp. nov.
„ brevis, sp. nov.
„ acutangulus, sp. nov.
„ excisus, sp. nov.
„ atratus, Burm.
„ sordidus, Boisd.
„ emarginatus, sp. nov.
„ sexdentatus, sp. nov.
„ MacLeayanus, Westw.
„ corrosus, sp. nov.
„ gracilis, sp. nov.
Lepidiota squammulata, sp. nov.
Lepidoderma albo-hirtum, gen. et sp. nov.

SERRICORNIA.

Rhipidocera mystacina, Fab.

BUPRESTIDÆ.

Chalcotænia elongata, sp. nov.
„ quadrisignata, Saund.
„ cuprascens, sp. nov.
„ quadri-impressa, sp. nov.
„ occidentalis, sp. nov.

HETEROMERA.

Atryphodes quadridentatus, sp. nov.

PHYTOPHAGA (CHRYSOMELIDÆ.

Diphyllocera striata, sp. nov.

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XIII. *Descriptions of some new species of short-tongued bees belonging to the genus* Nomia *of Latreille.*

By J. O. Westwood, M.A., F.L.S., &c.

[Read 3rd May, 1875.]

The following descriptions of short-tongued bees, remarkable for the structure of the hind legs, were written many years ago as portions of an intended monograph of the genus *Nomia* of Latreille. The names which I had applied to several of these species in the Collection of the British Museum were introduced by Mr. F. Smith in his "Catalogue of Hymenopterous Insects, Part I., *Andrenidæ* and *Apidæ*," published by the trustees of the British Museum in 1853. Other occupations have from time to time prevented me from completing this memoir, the materials for which had accumulated on my hands to an unexpected extent; amongst these the collection of Mr. Smith himself furnished not fewer than fifteen interesting species, all of which he has, with his usual liberality, allowed me to retain to the present time. The Hopeian Collection, including my own, and the Collection of the Old East India House, furnished many additions. The publication by Mr. Smith of many curious species of bees has at length aroused these materials from their long slumber; and I have thought it better to lay them before the Entomological Society in their present condition, rather than to allow so many remarkable insects to remain longer undescribed, or to be brought before the public one by one occasionally, as has already been the case with some of the recently recorded species of *Nomia* and allied bees.

The genus is not only of very large extent, but is also very widely distributed over the earth's surface. Species from India, China and Ceylon,—from tropical and Southern Africa,—from Australia and Van Diemen's Land, and from Brazil and Mexico,—are described below, whilst the typical species of the genus inhabit the South of Europe; and various species from the islands of the Eastern Archipelago have been lately described by Mr. Smith. The following is the list of the species contained in this

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memoir, as read at the meeting of the Entomological Society, without my being aware that Mr. Smith had introduced some of the species into his memoir, read on the 15th March, 1875. The descriptions, therefore, of the ten species in the following list marked with a * have been withdrawn:—

I. *Species from Asia.*

1.	*Nomia Buddha*	India.
2.	„ *Sykesiana*	Dukhun.
3.	„ *cilipes* (*N. combusta*, Smith) ..	Bombay.
4.	„ **Elliotii* 1	India.
5.	„ *iridescens*	India.
6.	„ *Silhetica* 2 (*N. aurifrons*, Smith)	Northern India.
7.	„ **capitata* 3	Northern India.
8.	„ **nasalis* 4 (*N. clypeata*, Smith)	India.
9.	„ **dorsalis* 5 (*N. thoracica*, Smith)	China.
10.	„ *punctata*	China.
11.	„ **chalybeata* 6	China.
12.	„ *rustica*	Ceylon.

II. *Species from Africa.*

13.	*Nomia calida*	Tropical Western Africa.
14.	„ *crudelis* (*N. tridentata*, Smith)	Gambia.
15.	„ **fulvohirta* 7	Sierra Leone.
16.	„ *patellifera*	Cape of Good Hope.
17.	„ **tegulata* 8	Port Natal.
18.	„ **cinerascens* 9	Port Natal.

III. *Species from Australia.*

19.	*Nomia hæmorrhoidalis* (*N. gracilipes*, Smith)	South Australia.
20.	„ **ænea* 10	Port Essington.
21.	„ **mærens* 11	Van Diemen's Land.

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1. *Nomia Elliotii*, Westw., MS. in Mus. Brit., and in Cat. Hym. Brit. Mus., i. p. 89; Smith, supra, p. 44.
2. *Nomia Silhetica*, Westw., MS. in Mus. Brit., and in Cat. Hym. Brit. Mus., i. p. 90. = *Nomia aurifrons*, Smith, supra, p. 43.
3. *Nomia capitata*, Westw., MS. in Mus. Brit., and in Cat. Hym. Brit. Mus., i. p. 90; Smith, supra, p. 54.
4. *Nomia nasalis*, Westw., MS. in Mus. Brit., and in Cat. Hym. Brit. Mus., i. p. 89. = *N. clypeata*, Smith, supra, p. 54.
5. *Nomia dorsalis*, Westw., MS., in Mus. Brit., and in Cat. Hym. Brit. Mus., i. p. 90. = *N. thoracica*, Smith, supra, p. 45.
6. *Nomia chalybeata*, Westw., in Mus. Brit.; Smith, supra, p. 59.
7. *Nomia fulvohirta*, Westw., MS. in Mus. Brit.; Smith, supra, p. 68.
8. *Nomia tegulata*, Westw, MS. in Mus. Brit.; Smith, supra, p. 69. Varies in the colour of the stigma from fulvous buff to dark brown.
9. *Nomia cinerascens*, Westw., MS. in Mus. Brit.; Smith, supra, p. 66.
10. *Nomia ænea*, Westw, MS. in Mus. Brit.; Smith, supra, p. 63.
11. *Nomia mærens*, Westw., MS. in Mus. Brit.; Smith, supra, p. 60.

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IV. *Species from America.*

22.	*Nomia Kirbii*	Brazil.
23.	„ *Cressoni*	Mexico.
24.	„ *cœlestina*	Mexico.
25.	„ *tarsalis*..	Brazil.
26.	*Monia grisea*	Mexico.

Several of the species of the genus (e. g., *N. Kirbii*, *N. Sykesiana*) are remarkable for having the antennæ terminating in a dilated knob-like joint, giving them the appearance of the antennæ of a butterfly. Another species, presenting the same peculiarity, differs from the other species in the dilated tongue, and comparatively slender and simple hind legs. These characters seem sufficient to warrant its separation as a distinct genus, to which I have applied the name of *Monia* as an anagram of that of *Nomia*. Another insect, with similar antennæ, from Java, has just been described by Mr. Ritsema in the Transactions of the Dutch Entomological Society, but having only two submarginal cells in the forewings, the ordinary 2nd and 3rd cells being thrown together; as however an irregularity in the discoidal cells of the forewings appears to exist, as shown in the two sides of the figure of the insect (plate 10, fig. 4), it is possible that the specimen represented may have been a monstrous *Nomia*, having irregularly developed veins. A fourth genus, with knobbed antennæ, is described by Mr. Smith (supra, p. 47).

I. Species Asiaticæ.

Nomia Buddha. (Pl. IV. fig. 1.)

Magna in genere, capite, occipite et parte anticâ thoracis fulvo-fusco-hirtis; facie subalbido-hirtâ, antennis nigris, apice rufescentibus, abdomine nigro obscuro, segmentis (nisi apicali) utrinque fasciâ abbreviatâ marginali albo-virescenti; femoribus et tibiis posticis brevibus crassis, his subtus lobo parvo obtuso armatis; tarsis posticis tibiis fere duplo longioribus, articulo basali elongato, basi crassiori.

Long. corp. lin. 8½; expans. alar. antic. lin. 13½.

Habitat in Indiâ Orientali. In Mus. Hopeiano Oxoniæ et Smith.

This large species is distinguished by its very short and thick hind femora and tibiæ, and the elongated joint of the hind tarsi, thickened at the base, and gradually becoming thinner to the tip. The general surface of the body is obscure, except the narrow posterior margins of the abdominal segments; the face is clothed with whitish

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hairs, the back of the head and front of the thorax with fulvous-brown ones; the remainder of the thorax, the basal segment of the abdomen, and the posterior femora, with brown hairs. The scutellum is emarginate on its hind margin; the tegulæ are fulvous-brown, with the edge paler. The abdomen is black and obscure; the basal portion of each segment is very delicately punctate and setose, and separated from the hind part by a transverse impression, leaving the apical portion in the 3rd and 4th segments broader than the basal part; this hinder part is smooth and but slightly setose, and marked on each side with a pale, greenish-white, transverse, marginal spot, which is of a triangular form in the 5th segment. The mandibles are slender, black and entire, and pointed at the tip; the maxillæ are small, and the tongue elongated and densely ciliated, especially in the middle part; the paraglossæ are rather more than half the length of the labial palpi, slender, and pointed. The antennæ are rather short, black, with the terminal joint pitchy-red. The legs are short; the hind femora very much thickened and curved, entire on the under edge; the tibiæ are very short and triangular, with a black polished impression on the outside at the extremity; on the underside they are furnished with a small, conical, obtuse lobe; the calcaria are long, the inner one finely serrated, or rather clothed, with short, erect, stiff hairs; the posterior tarsi clothed with a thick coating of fulvous hairs on the underside; the wings are slightly stained with brown, the apical margin being darkest. The first recurrent vein of the forewings enters the 2nd submarginal cell beyond the middle, and the 2nd recurrent vein at about two-thirds of the length of the 3rd submarginal cell. The 4th and following segments of the abdomen on the underside are furnished with large, rounded, ciliated plates of a remarkable form, which want of specimens has not enabled me to examine as completely as I could have wished.

The species differs from *N. strigata*, Fabr., in the thorax being destitute of the lateral margin of white hairs, and in not having the abdominal segments marked with entire pale marginal fasciæ, as well as in the colours of the feet; from *N. crassipes*, Fab., it also differs in the same respects, and in not having the hind legs spined.

Pl. IV. fig. 1, *Nomia Buddha* rather magnified; 1*a*, head seen in front; 1*b*, ditto sideways; 1*c*, labrum; 1*d*, mandible; 1*e*, maxilla detached; 1*f*, ditto in situ; 1*g*, lower

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lip and tongue; 1*h*, hind leg; 1*i*, ventral view of the abdomen of the male.

Nomia Sykesiana. (Pl. IV. fig. 2.)

Capite nigro, griseo-setoso, lineâ setarum albidarum utrinque inter oculos et antennas, his fulvis, basi et articulo apicali dilatato nigris; thorace fulvo-setoso, abdomine nigro, fasciis 5 marginalibus in medio interruptis albis; pedibus posticis castaneis, albido-setosis, femoribus dilatatis; tibiis brevibus, subtrigonis, angulo interno apicali acuminato, supra excavato, margine supero excavationis angulato, tarsis elongatis.

Long. corp. lin. 5; expans. alar. antic. lin. 9.

Habitat in Indiâ Orientali (Col. Sykes). In Mus. Indico Orientali, Lond.

This species is distinguished by having the terminal joint of the fulvous antennæ black and dilated into a flattened knob, and by the interrupted white fasciæ of the abdomen. The head is clothed with short brownish-grey hairs, with a line of whitish hairs on each side of the face between the antennæ and eyes. The antennæ are quite filiform, except the terminal dilated joint. The thorax is clothed with brown hairs, those of the anterior part being of a more fulvous hue; the scutellum is simple and convex; the tegulæ are kidney-shaped and fulvous-brown, with a slender, pale, raised edge. The abdomen is much larger than the thorax; it is very delicately and closely punctured and finely setose, each segment having a deep transverse central impression, the hind part of each segment being smoother and marked with a transverse white fascia interrupted in the middle. The wings are slightly stained with brown, having the terminal portion, beyond the cells, reddish-brown. The two recurrent veins join the second and third submarginal cells at two-thirds of the length of their under sides. The hind femora are short and strongly dilated, the under edge not dentate, but with a longitudinal impression; the hind tibiæ are short and nearly trigonate, the inner apical angle produced and acute; the upper edge between the apex and the base of the tarsi with an impressed space, the upper angle of which is produced upwards. The hind tarsi are much elongated.

Pl. IV. fig. 2, *Nomia Sykesiana* magnified; 2*a*, antenna; 2*b*, hind tibia and basal joint of the tarsus seen more laterally than in the figure of the insect.

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Nomia aurifrons.

Nomia aurifrons, Smith, Trans. Ent. Soc. Lond. (1875), p. 43 (♀).

(*N. Silhetica*, Westw., MS. in Mus. Brit., and in Cat. Hym. Brit. Mus., i. p. 90.)

Mr. Smith having described the female only, the following description of the male is here given :—

Male less elongated than either *N. Elliotii* or *iridescens*. Head black, glossy, strongly punctate behind the antennæ; face densely clothed with pubescent, decumbent hairs. Mandibles and antennæ pitchy, the latter redder in the middle. Thorax black above, opake, thickly and closely punctate, and clothed with very short, brown, erect hairs; sides before the wings with a patch of luteo-fulvous hairs, with which also the post-scutellum (destitute of spines) is thickly clothed. Abdomen elongate-ovate above, opake, and entirely covered with very fine close punctures, the first and following segments having a broad apical margin of short decumbent fulvous hairs, which increase in width in the apical segments; the first segment also with the basal part clothed with very short luteous hairs. Abdomen beneath flat; the 2nd, 3rd and 4th segments with an apical band of fine greyish hairs; the 5th somewhat raised on each side into a low tubercle; the 6th very small and divided down the middle. Legs fulvous; the femora pitchy-black, except at the tips; femora and tibiæ of the hind legs not thicker, but less hairy, than those of the female. Wings slightly stained, with the tips rather darker; veins and stigma pale fulvous; first recurrent vein inserted between the middle and hinder angle of the 2nd submarginal cell.

Female with the face slightly clothed with greyish-buff hairs. Abdomen considerably broader than in the male.

Nomia combusta. (Pl. IV. fig. 3.)

Nomia combusta, Smith, Trans. Ent. Soc. Lond. (1875), p. 56, pl. ii. fig. 9 (posterior leg).

(*N. cilipes*, Westw., MS. in Mus. Ind. Orient. Lond., and in the MS. of this Memoir.)

Facie, occipite, et thoracis dorso setis fulvis brevissimis obsitis; scutello inermi, abdomine nigro, dorso fulvo-setoso, cingulis quinque apiceque fulvis, antennis pedibusque fulvo-flavescentibus, tarsis anticis parum dilatatis et externe

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longe ciliatis; femoribus posticis clavatis, tibiis brevibus curvatis, sensim dilatatis, apice intus acuminato dilatato.

Long. corp. lin. 4½; expans. alar. antic. lin. 7¼.

Habitat in Indiâ Orientali, Dukhun, Bombay. In Mus. Ind. Orientali Lond. et Smith.

Pl. IV. fig. 3, *Nomia combusta* magnified; 3*a*, hind leg.

Nomia iridescens.

Gracilis, nigra, tenuissime punctatissima, griseo parum setosa; post-scutello inermi, abdominis segmentis 2—5 postice anguste viridi-iridescenti annulatis, pedibus posticis maris vix incrassatis. (Mas et fem.)

Long. corp. lin. 5; expans. alar. antic. lin. 8.

Habitat in Indiâ Orientali. In Mus. Britann.

A slender species. Upper surface black, and throughout very closely but delicately punctured, and but slightly clothed with griseous hairs; face with a fine central carina. Antennæ and mandibles black; the latter pitchy at the tips. Thorax black; the punctures rather larger than those of the head. Scutellum and post-scutellum simple. Tegulæ dirty buff, black at the base. Abdomen of the male narrow, convex, black, with the transverse impressions slight, and with fine black hairs, the space between the hinder one of each segment and the hind margin polished; the second and three following segments with a slender edge of iridescent green. Abdomen beneath flattened, pitchy, the scales of the fourth segment produced and angulated in the middle, extending nearly to the anus, divided longitudinally down the middle. Legs black; tarsi pitchy. Hind femora of the male but slightly incrassated, slightly curved; tibiæ also but slightly incrassated and curved, the outer apical angle rounded off, the inner one not produced. Wings slightly stained, the tips scarcely darker than the base; veins dark brown, the first recurrent vein inserted about the middle of the second submarginal cell.

Female shorter and more robust; legs black, tibiæ and tarsi clothed with pitchy hairs; abdomen with the band on the fifth segment obliterated.

Nomia punctata.

Nigra, subnitida, rude punctata, facie et marginibus thoracis griseo-setosis, post-scutello spinis duabus armato, abdominis segmentis paullo constrictis, segmentis 2—5

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margine postico tenui viridi; pedibus nigris, femoribus posticis maris incrassatis curvatis, tibiis curvatis, compressis, apice interno intus producto, et oblique truncato; alis limpidis. (Mas et fem.)

Long. corp. lin. 5; expans. alar. lin. 8.

Habitat in Chinâ. In Mus. Britann.

Black, strongly punctured on the upper side; face and sides of the thorax sparingly clothed with fine grey hairs. Antennæ black, terminal joint pitchy. Thorax above black, strongly punctured, the entire margins sparingly clothed with grey hairs; mesonotum with a fine, central, simple impressed line down the centre and a shorter one on each side of it in front, and an abbreviated one on each side, close to the tegulæ; scutellum on each side produced into a small angulated tubercle; post-scutellum armed with two reflexed spines; abdomen black, shining, dorsal segments with a deep transverse impression, the basal portion of each strongly punctured, the hinder portion smooth and polished, finely setose; the 2nd and three following segments marked with a slender, green-blue, transverse fascia; tegulæ black, glossy, with a slender whitish margin; legs black; tarsi pitchy, sparingly clothed with greyish-buff setæ; the basal joint of the tarsi more thickly setose; hind femur of the male incrassated, very gibbose on the upper side in the middle, slightly concave beneath; hind tibiæ elongate, triangular, roundly curved along the outer edge, the inner one straighter, the inner angle pitchy-red and considerably produced, and obliquely truncate close behind the tibial spurs. Fourth ventral plate of the male nearly flat, with a slight impressed line down the middle, terminal segments deeply impressed, the edges with a thick row of incurved hairs. Wings nearly colourless, with the first recurrent vein running into the middle of the 2nd submarginal cell.

Nomia rustica.

Nigra, subtilissime punctata, abdomine lævi (segmenti 2di basi tantum punctato), griseo parum setosa, post-scutello inermi, abdominis segmentis 2do—5to margine postico tenui albo, pedibus posticis subsimplicibus. (Mas.)

Long. corp. lin. 3; expans. alar. lin. 5½.

Habitat Ceylon. From the Collection of Mr. Cuming. In Mus. Britann.

Face not carinated, finely punctured, slightly clothed with short grey hairs at the side. Antennæ rather short,

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brown, basal joint black. Thorax black, very delicately and closely punctured, very slightly clothed with short grey hairs; post-scutellum unarmed; abdomen ovate, subconvex, black, nearly smooth, slightly setose; 2nd segment with the basal portion preceding the first transverse impression rather coarsely but widely punctured, hinder edge of this and three following segments white; beneath flat, glossy, very finely punctured, 4th segment with the hind margin straight; 5th very small, forming two rounded, flattened lobes in the middle. Legs black, hind femora simple, slightly thickened in the middle, on the under-side, which is convex; hind tibia of ordinary length, elongate, subtriangular, the inner apical angle produced into a short conical point, hind tibiæ very slender. Wings stained yellowish-brown. Stigma brown, veins black, the 1st recurrent vein in a line with the outer edge of the 2nd submarginal cell.

II. Species Africanæ.

Nomia calida. (Pl. IV. fig. 4.)

N. nigra, opaca, fusco breviter pubescens, facie aureo-sericanti; antennis brunneis, subtus fulvis; tegulis fulvis; abdomine aureo-flavescenti, 5-annulato, apiceque concolori; pedibus fulvo-flavis, femoribus posticis inflatis, basi fuscis, dente parvo ultra medium marginis externi et inferi armatis, tibiis trigonis, angulo interno apicali acuminato; alis parum fuscis, fulvo-tinctis, venis fulvescentibus.

Long. corp. lin. 5; expans. alar. antic. lin. 8.

Habitat in Africâ tropicali. In Mus. Hopeiano Oxoniæ (olim nostr.).

The bright, golden-yellow fasciæ of the abdomen at once distinguish this species, which is of moderate size, and clothed with very short pubescence, being destitute of gloss; this pubescence on the face is very thick, and of a pale-golden colour; on the top of the head and thorax it is browner. The abdomen has the hind margin of each segment of a fulvous-yellow colour, as is also the apex. The antennæ are of moderate length, with the second joint distinct; the mandibles are entire (fig. 4*b*); the tongue is considerably elongated (fig. 4*c*); the legs are fulvous-yellow, the hind femora moderately swollen and pubescent, with the basal half dark brown, having a small tooth on the outer under edge beyond the middle; the hind tibiæ are yellow, with a small dusky patch on the outside,

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near the base; they are subtrigonate, rather curved, the inner apical angle being produced to a point; the tarsi are elongated, the basal joint moderately dilated, with the sides parallel, and about as long as the remainder of the tarsal joints united. The wings are brownish, with the veins fulvous; the stigma brown.

Pl. IV. fig. 4, *A. calida* magnified; 4*a*, antenna; 4*b*, mandible; 4*c*, tongue and labial palpi; 4*d*, terminal segments of the abdomen beneath; 4*e*, hind leg.

Nomia tridentata. (Pl. IV. fig. 5.)

Nomia tridentata, Smith, Trans. Ent. Soc. Lond. (1875), p. 64, pl. ii. fig. 10 (posterior leg).
(= *Nomia crudelis*, Westw., MS., ante, p. 208.)

Nigra, capite et thorace pubescentiâ densâ lutescenti indutis, facie subalbidâ, antennis castaneis, abdomine nigro, luteo-setoso, marginibus segmentorum luridis aut luteo-griseis, setis magis fulvis; femoribus posticis valde incrassatis, fere globosis, subtus dentibus tribus acutis armatis; tibiis elongato-trigonis, angulo interno apicali longe elongato, apice acuto.

Long. corp. lin. 4½; expans. alar. antic. lin. 7½.

Habitat Gambia, Afric. tropic. In Mus. Britann., Hopeiano Oxoniæ et Smith.

Pl. IV. fig. 5, *Nomia tridentata* magnified; 5*a*, the hind leg.

Nomia patellifera. (Pl. IV. fig. 6.)

Nigra, opaca, cinereo-setosa, facie lutescenti setosâ, abdominis segmentis tenue albido-marginatis; femoribus tibiisque castaneis basi et apice pallidioribus, tarsis anticis in patellam magnam planam albam dilatatis, femoribus posticis clavatis, subtus dente parvo unico armatis; tibiis mediocriter dilatatis, angulo interno apicali elongato acuminato. (Mas.)

Long. corp. lin. 5; expans. alar. antic. lin. 9.

Habitat apud Promont. Bonæ Spei. In Mus. Smith.

The curiously dilated anterior tarsi of the male are quite characteristic of this species, which is rather slender and delicately punctured; the face is thickly clothed with dull-luteous hairs; the antennæ are slender and black, pitchy beneath; the thorax is ovate, obscure black, with the sutures tinged with brown; the scutellum simple; the tegulæ are dark brown; the metathorax clothed with grey hairs; the abdomen is elongate-obovate, finely punctured,

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black, with the transverse impressed line of each segment quite close to its posterior margin, which is narrowly white and slightly constricted, the constricted part being much more delicately punctured; the four anterior legs are fulvous beneath, with a brown shade above along the middle; the fore tarsi are white, with the ungues and pulvillus conspicuously black; the hind femora are pitchy, more fulvous at the base and beneath; the tibiæ pale whitish, dusky in the middle; the basal joint of the four posterior tarsi is whitish, the remainder of the joints pitchy, with whitish hairs; the wings are slightly stained, the extremity darker brown and the stigma black; the first recurrent vein of the forewings arises near the extremity of the second discoidal cell, and the second recurrent vein a little beyond the middle of the third discoidal cell: the abdomen beneath is pitchy, with broad grey margins to the segments.

Pl. IV. fig. 6, *Nomia patellifera* magnified; 6*a*, anterior tarsus; 6*b*, terminal joint of ditto; 6*c*, hind leg; 6*d*, extremity of the underside of the abdomen.

III. Species Australasiaticæ.

Nomia gracilipes. (Pl. V. fig. 1.)

Nomia gracilipes, Smith, Trans. Ent. Soc. Lond. (1875), p. 61.

(*Nomia hæmorrhoidalis*, Westw., MS., ante, p. 208.)

Elongata, gracilis, nigra, capite et thorace fusco-villosis, facie inferâ albo-villosâ, thorace fasciculis parvis setarum albarum ornato, abdomine nigro apice fulvo, marginibus segmentorum cyaneis; segmentis tribus basalibus utrinque fasciâ abbreviatâ setarum albarum; pedibus posticis elongatis, paullo incrassatis. (Mas.)

Long. corp. lin. 5; expans. alar. antic. lin. 9.

Habitat in Australasiæ partibus australibus. In Mus. Smith.

IV. Species Americanæ.

Nomia Kirbii. (Pl. V. fig. 2.)

Nomia Kirbii, Westw., MS. in Mus. Brit.; Smith, Trans. Ent. Soc. Lond. 3rd Ser. Vol. 2, p. 398, pl. xxi. fig. 5 (antenna), and Vol. 1875, p. 69, pl. ii. fig. 19, 20 ♂ (antenna and posterior leg).

Nigra, crebre punctatissima, piceo-pubescens, antennis articulo apicali, capitulo rotundato compresso, femoribus intermediis crassis, dente obtuse subbasali infero;

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tarsis intermediis articulo basali in medio supra angulato-dilatato, femoribus posticis mediocribus, tibiis crassis subtrigonis, apice infero producto. (Mas.)

Long. corp. lin. 8½; expans. alar. antic. lin. 16.

Habitat in Brasiliâ (Kirby, MS.). In Mus. Britan. (olim Kirby).

To this species, which was unique in the collection of the Rev. W. Kirby, was attached a note, "Gen. N. inter Andrenam et Panurgum, ♂ sed pollinifer [!] ex tibiis posticis. Mus. Norvic. Brasilia." At the sale of the Entomological Society's collection the specimen passed to the British Museum, where it still remains unique.

Entirely black, clothed with short sooty-black hairs; the face on each side more thickly clothed with hair, the back of the head finely punctate and nearly naked; the antennæ are rather shorter than the thorax, the basal joint strongly setigerous, the second joint distinct, the last joint dilated and flattened into a rounded capitulum; the thorax is nearly round, with large tegulæ finely setose; the mesonotum opake and closely punctured; the metathorax glossy, with a central deep longitudinal impression and a transverse basal impression deeply and closely punctured; the wings are stained with brown and glossy; the abdomen is elongate-obovate, finely and closely punctured, each segment with a transverse impression beyond the middle: the middle femora are thickened and compressed, with an obtuse dentate lobe near the base beneath; the posterior femora are thickened but unarmed; the posterior tibiæ much dilated, forming a trigonate mass, with the inferior inner angle produced into an obtuse tooth; the basal joint of the posterior tarsi is much elongated and setose, especially on its under edge; the first recurrent vein of the forewings is received at about two-thirds of the length of the second submarginal cell.

Pl. V. fig. 2, *Nomia Kirbii* magnified; 2*a*, maxilla and its palpus equal-jointed; 2*b*, labium and tongue; 2*c*, antenna; 2*d*, hind foot; 2*e*, terminal segments of male abdomen.

Nomia Cressoni. (Pl. V. fig. 3.)

N. nigra, punctata, subnitida, fuscescenti-villosa; antennis longis, apice gracillimis, tegulis piceis glabris; abdomine oblongo, segmentis 2—5 margine postico glabris, opalino-virescentibus; femoribus posticis brevibus, valde incrassatis, subglobosis; tibiis brevissimis, subconicis, crassis, angulo

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interno apicali late producto et albido, tarsis posticis articulo basali maximo, compresso, fulvescenti.

Long. corp. ♂ lin. 8½; expans. alar. antic. lin. 15.

Habitat in Mexico (D. Coffin, Hym. No. 96). In Mus. Hopeiano Oxoniæ (olim nostr.).

This is one of the finest and largest species of the genus, remarkable for the length of the male antennæ, which are gradually attenuated beyond the middle, and terminated in an acute point; they are black at the base and on the upper side, but fulvous-brown beneath and at the tip, the second joint is scarcely visible, the face is clothed with greyish-luteous hairs. The mandibles are elongate-conic, pointed at the tip, with a strong conical tooth in the middle of the upper edge; the labrum is short, rounded in front, and ciliated; the maxillary palpi are scarcely larger than the labial. The thorax is short and nearly rounded; the pubescence of the front part being more luteous than that of the posterior portion; the scutellum is short and entire, but with a longitudinal central impression; the abdomen is elongate-ovate, punctured, and moderately clothed with blackish hairs; each segment has a strong transverse impression beyond its middle, the hinder portion of each being smooth and of a beautiful opaline-green colour in the 2nd, 3rd, 4th and 5th segments, the pale-coloured margin in the last segment being attenuated on each side; the hind femora are short, and very much incrassated, especially on the upper side, but destitute of spines on the under side; the tibiæ are very short and thick, the inner angle being produced into a thick, obtuse lobe, concave within (the two calcaria arising within the excavation), and of a dirty-white or buff colour, which is also the colour of the basal joint of the posterior tarsi, which is much elongated and broadly compressed, widest at its base, the inner edge being slightly concave, so as to give the idea of its being a pollinigerous corbicula. The 2nd and 3rd ventral segments are divided by a straight, central, longitudinal impression into two flattened opaque lobes in the middle of each joint, the sides being strongly setose; the first recurrent vein arises at about two-thirds of the length of the 2nd submarginal cell, and the second recurrent vein at about three-fourths of the length of the 3rd submarginal cell. The female has simple black antennæ, simple legs, the hind ones not corbiculated, and only three green fasciæ on the abdomen.

Pl. V. fig. 3, *Nomia Cressoni*, male, slightly enlarged;

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3*a*, the face and antenna; 3*b*, labrum; 3*c* and 3*d*, mandibles; 3*e*, maxilla; 3*f*, labium and tongue; 3*g*, 3*h* and 3*i*, the hind leg and its tibia in different points of view.

Closely allied to *Nomia Nortoni* of Cresson (Trans. Amer. Ent. Soc. Vol. I. No. 4, p. 385), but the male of that insect is described as having three long acute spines on the inner edge of the excavation of the posterior tibiæ, which is not the case with my species, of which I have received several examples of both sexes.

Nomia cælestina. (Pl. V. fig. 4.)

Læte purpureo-cærulea, crebre punctatissima, capite et thorace fulvo-hirtis, metathorace et abdominis basi griseo-hirtis; antennis nigris, subtus piceis, pedibus flavis, femoribus basi æneis, posticis supra viridi-nitidis, incrassatis; tibiis crassis, tarsis posticis articulo basali crasso compresso, subtus biemarginato. (Mas.)

Long. corp. lin. 6; expans. alar. antic. lin. 10.

Habitat in Mexico (D. Coffin, Hym. No. 94). In Mus. Hopeiano Oxoniæ (olim nostr.).

This very elegant species is of a rich purple-blue colour, very finely and closely punctured, the head and thorax thickly clothed with fulvous hairs, except the hind portion of the latter, in which the hairs are of a greyer colour, as they are also on the base of the abdomen and upper side of the hind femora; the anterior margin of the upper lip and the mandibles are clear yellow; the antennæ are black above, but pitchy-red beneath; they are short, with the 2nd joint distinct; the tegulæ are of moderate size, the abdomen ovate, each segment above having a transverse raised ridge of a black colour beyond the middle, the posterior margin of each segment being glabrous; the legs are short and yellow-coloured, and the femora and tibiæ in all the legs marked above and at the sides with dark æneous or purple; the posterior femora are much swollen and slightly angulated near the base of the under edge; the hind tibiæ are regularly clavate, with the calcaria scarcely visible; the hind tarsi have the basal joint broad and compressed, with a long shallow emargination along the middle of its under edge, and with a much deeper and smaller one at the extremity of the same edge; the first recurrent vein in the forewings is received at about two-thirds of the length of the 2nd submarginal cell, and the second recurrent vein at about three-fourths of the 3rd submarginal cell. The underside of the terminal ven-

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tral segments have the hairs arranged to form a semicircle in each.

Pl. V. fig. 4, *N. cœlestina* magnified; 4*a*, hind foot; 4*b*, terminal segments of the abdomen.

Nomia tarsalis. (Pl. V. fig. 5.)

Parva, nigra, subopaca, crebre punctatissima, griseo-setosa, labro et mandibulis extus albidis, tegulis tarsisque brunneis, pedibus posticis incrassatis, tarsorum articulo basali in medio spinâ acutâ armato, segmentis abdominalibus apice tenue albido-setosis.

Long. corp. lin. 3½; expans. alar. antic. lin. 6½.

Habitat in Brasiliâ (Hon. D. Ellis). In Mus. Hopeiano Oxoniæ (olim Curtis, Saunders et nostr.).

This little bee is at once distinguished by the structure of the basal joint of the posterior tarsi; it is black, finely punctured, and moderately clothed with grey pubescence; the small square upper lip, and outside of the mandibles, dirty white; the antennæ are black; the abdomen is ovate, being gradually pointed to the tip, convex, and with the transverse impression near the extremity of each dorsal segment scarcely defined, the apical margin being glossy and sparingly clothed with a row of short grey hairs. The legs are black, with the tibiæ and tarsi pitchy: the hind femora more chestnut on the inside; these are swollen above, and with a broad dilatation near the base on the underside; the posterior tibiæ are clavate, slightly excavated and setose on the inner edge between the middle and extremity; the basal joint of the hind tarsi is two-thirds of the length of the tibia, compressed, with a deep emargination on its underside between the middle and apex; its upper angle produced into a sharp tooth.

Pl. V. fig. 5, *Nomia tarsalis* magnified; 5*a*, the hind leg.

Monia, nov. gen.

Mandibulæ parvæ graciles, dente interno instructæ.

Maxillæ elongatæ, palpo 6-articulato.

Mentum gracile, subcylindricum, linguâ apice lato bifido, membranaceo-setoso, utrinque lobo laterali instructâ. Palpi labiales minuti, 4-articulati. Antennæ articulo 1mo parvo, apicali in mare dilatato compresso. Pedes postici satis graciles, tibiâ intus dense setosâ; tarsi graciles. Cellulæ submarginales 2da et 3tia in alis anticis fere æquales.

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Monia grisea. (Pl. V. fig. 6.)

Tota nigra, subnitida, griseo-setosa, punctata, antennis subtus luteis, abdomine segmentis dorsalibus pone medium impressione transversâ notatis, parte pone impressionem in singulo, fasciâ e setis griseis formatâ, notatâ.

Long. corp. lin. 4; expans. alar. lin. 7½.

Habitat Mexico, prope Piedad Road (D. Coffin, Hym. No. 250). In Mus. Hopeiano Oxoniæ (olim nostr.).

This bee is of small size, black, glossy, punctate, and more or less sparingly clothed with grey hairs in different parts, especially on the lower part of the face and the sides and hind part of the thorax. The antennæ are slender, and nearly as long as the head and thorax; black above, but pitchy-red beneath, with the basal joint short, and the terminal one dilated into a flattened, glossy, lozenge-shaped capitulum. The tegulæ are of moderate size. The scutellum is entire. The abdomen ovate, convex, with the ordinary transverse impression near the posterior margin of each segment. The hind legs are simple; the tibiæ elongate, with long hairs on the inner edge, and with two long calcaria; the tarsi of the hind legs are simple and finely setose. The 2nd submarginal cell is nearly as large as the 3rd, being angulated at its basal side, the 1st recurrent vein being received at about the middle of its length; the 3rd submarginal cell is much narrowed in front, with the 2nd recurrent vein arising at a little distance beyond the middle of its hind margin.

Pl. V. fig. 6, *Monia grisea* magnified; 6*a*, mandible; 6*b*, maxilla; 6*c*, mentum and tongue apparently destitute of paraglossæ.

Description of the Plates.

PLATE IV.

Fig. 1. *Nomia Buddha.*
2. „ *Sykesiana.*
3. „ *combusta.*
4. „ *calida.*
5. „ *tridentata.*
6. „ *patellifera.*

PLATE V.

Fig. 1. *Nomia gracilipes.*
2. „ *Kirbii.*
3. „ *Cressoni.*
4. „ *cœlestina.*
5. „ *tarsalis.*
6. *Monia grisea.*

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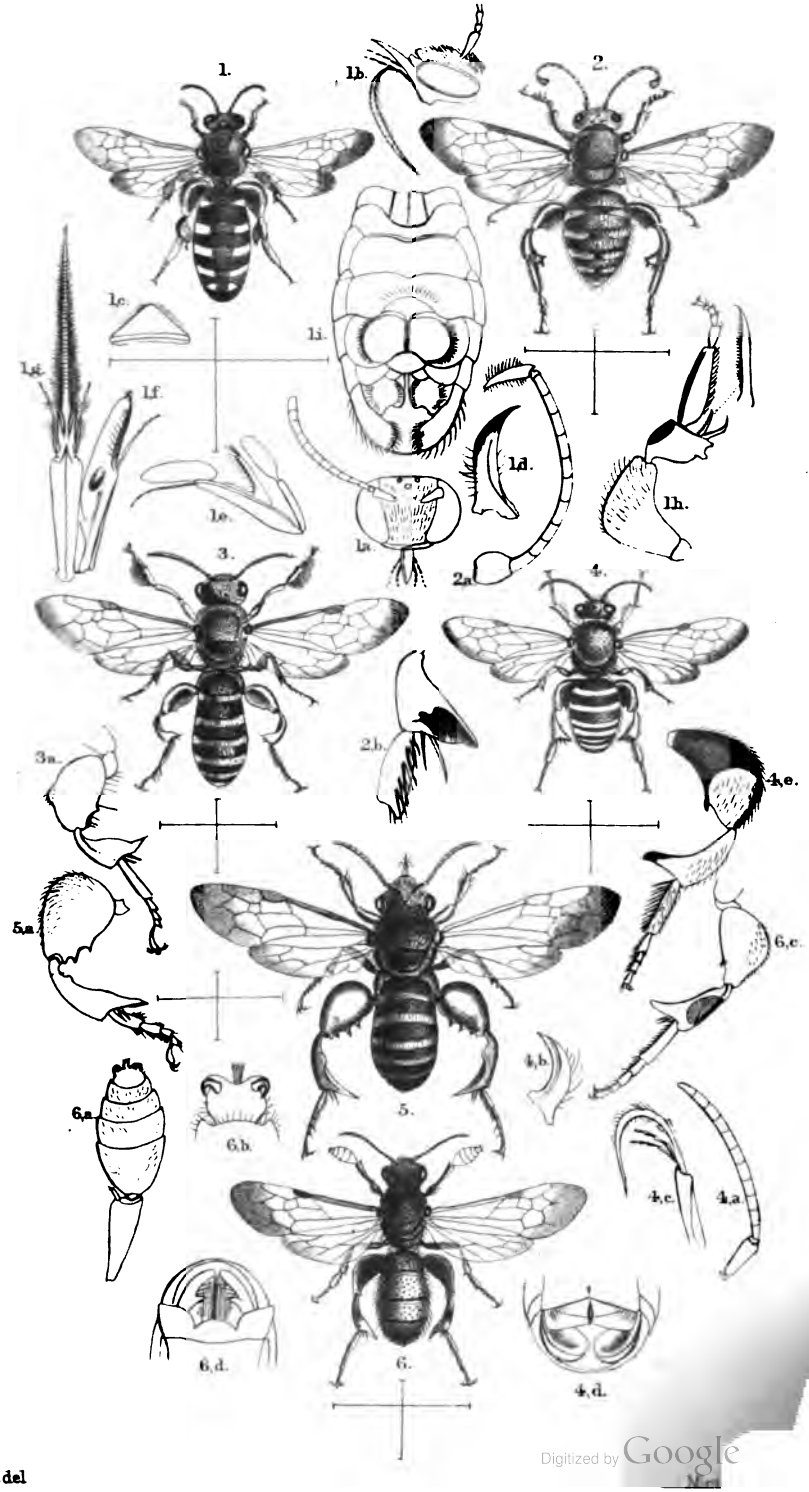

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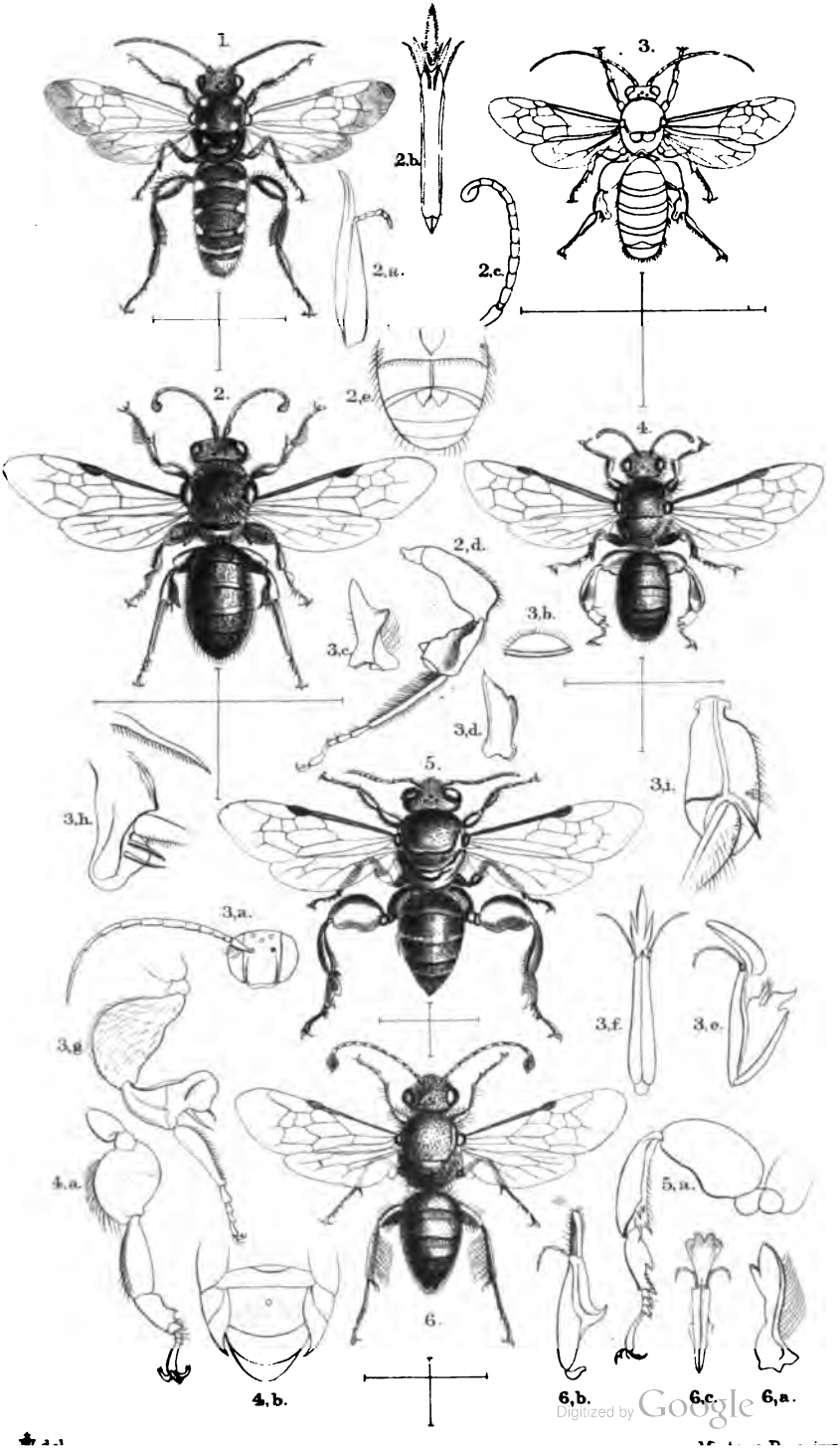

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XIV. *Descriptions of new Heteromerous* Coleoptera.

By J. O. Westwood, M.A., F.L.S., &c.

[Read 5th July, 1875.]

Family BLAPSIDÆ.

Genus Moluris.

Moluris (*Phanerotoma*) *Rowleiana*, Westw. Proc. Ent. Soc. 3rd Ser. Vol. 2, Proc. p. 2. (Pl. VI. fig. 1.)

Habitat Zambesi (D. Rev. H. Rowley). In Mus. Hopeiano Oxoniæ et Mus. Brit.

Long. capitis 1⅔ lin.; prothoracis lin. 6; elytrorum lin. 15; lat. prothoracis ante medium 7⅔ lin.; lat. elytrorum paullo ante medium lin. 8¼.

This species is about the same size as *M. Bertolinii* of Guérin-Méneville, but is less attenuated in the hind part of the elytra. It is obscure black, finely and closely punctured on the head and thorax; the latter is moderately convex, dilated at the sides, which are widest rather before the middle; the anterior and lateral margins are very slightly raised. The elytra are entirely clothed with dull luteous pile, except the suture and four costæ on each, which are raised, black and glossy; the first of these costæ extend to about two-thirds of the length of the elytra, the second, third and fourth are gradually longer, and are united together at their hind extremities. The legs are of moderate length, the anterior tibiæ terminate in a broad calcar obtusely and obliquely truncate (fig. 1*a*). The outer apical angle of the tibiæ is rounded off, the hind tibiæ are curved, the outer apical angle being outwardly produced.

The underside of the abdomen in our specimens is destitute of hairs.

Moluris (*Phanerotoma*) *gravida*. (Pl. VI. fig. 2.)

Nigra, subopaca, prothorace striolato-punctato, dorso convexo, lateribus rotundatis; elytris magnis, oblongo-

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ovatis, coriaceis, irregulariter et oblique subimpressis versus basin, disco costis tribus mediocriter elevatis et subobscuris, disco minutissime et confertissime punctatis, versus apicem setis griseo-rufis parum obsitis.

Long. capitis lin. 2; prothoracis lin. 6; elytrorum lin. 17; lat. prothoracis ad basin lin. 6½; lat. elytrorum in medio lin. 11.

Habitat Damara Land Africæ meridionalis (D. Anderson). In Mus. Hopeiano Oxoniæ et Mus. Brit.

This species is larger and much more robust than the preceding or *M. Bertolinii*. The head is finely punctured, with a raised swelling between the eyes; the prothorax is very convex, the sides regularly rounded, the greatest width being slightly before the middle; the disc is entirely covered with minute but irregular elongated punctures, which give it a granular appearance within the posterior lateral angles; the sides are also swollen. The elytra are broadly oblong-ovate, being broader across the middle; black towards the apex, clothed with dirty-reddish setæ; near the base and towards the place of the scutellum they are irregularly and obliquely rugose, with indistinct striolæ, with a short costa, and the disc of each has three broad and but moderately well-defined costæ, which extend about three-fourths of the length of the elytra. The posterior tibiæ have the outer angle elongated and obtuse. All the ventral segments of the abdomen are clothed with a broad patch of erect rufous hairs.

Moluris Procrustes. (Pl. VI. fig. 3.)

Nigra, minutissime punctatissima; elytris ovatis, marginatis, basi glabris, nitidis; mesonoto supra detecto, convexo et punctato; pedibus mediocribus, crassis; tibiis anticis calcari elongato gracili, apice obtuso; tibiis posticis curvatis, angulo externo apicali producto et oblique truncato.

Long. corp. lin. 19; pronot. lin. 5½; elytr. lin. 13; elytr. lat. ante medium lin. 8.

Habitat Delagoa Bay Africæ meridionalis. In Mus. Hopeiano Oxoniæ.

The head and pronotum are finely and closely punctured; the latter is very convex, regularly rounded at the sides, which are finely marginated, the greatest width being across the middle, with the posterior angles rounded off, and two slight impressions near the hind margin; the exposed part of the mesonotum in the place of a broad

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scutellum is strongly punctured; the extreme base of the elytra is raised towards the suture and glossy, the remainder being very finely and minutely granulose-punctate; the sides are margined, and on the disc of each are very faint traces of two longitudinal striæ; the anterior tibiæ are broad, slightly curved and flattened, with a longitudinal impression on the upper side; the terminal calcar is elongated, narrow and rounded at the tip; the hind tibiæ are rather curved, with the outer apical angle considerably and broadly produced and truncate. The body beneath is black, polished and punctured, the middle part of each ventral segment being densely covered with minute punctures and clothed with pitchy-brown, velvet-like plush, less distinct on the terminal segment; the prosternum between the anterior coxæ has its lateral margins thin and slightly raised, and with a slender smooth impressed line down the middle.

Family MYLABRIDÆ?

Genus RHYSODINA, Westw. MSS., Chevrolat in Ann. Soc. Ent. France, 1873, p. 205 (*Rhyzodina*).

Insectum valde anomalum, antennis valde difformibus, pronoto et elytris alte costatis coriaceis, illo lateribus in medio angulato productis, his transverso-sulcatis. Caput verticale, subquadratum, medio depressum, bituberculatum, ante oculos in lobos duos elevatos suboblique truncatos formatum, in quo antice insident antennæ formæ omnino insolitæ; 8-articulatæ, longitudine capitis et dimidii pronoti, articulo 1mo crasso obtrigono, angulo supero extus producto, articulis 2ndo, 3tio, 4to, 5to et 7mo transversis prismaticis utrinque acute angulatis; 6to ovali, basi glabro, dimidio apicali spongioso; 7mo 8vo minori, hoc acetabuliformi, apice tumido; reliquis apicalibus deteritis. Oculi reniformes, transversi. Labrum parvum, transversum, vix emarginatum, angulis anticis lateralibus rotundatis, intus membranâ setigerâ vestitum ultra marginem anticum extensâ. Mandibulæ breves, trigonæ, apice in unguem arcuatum acutum integrum terminatæ. Maxillæ parvæ, lobis duobus inermibus setosis instructæ; palpi maxillares breves, crassi, articulo ultimo reliquis longiori et crassiori; mentum obconicum, basi truncatum, angulis anticis rotundatis; labium minutum, transversum, breviter setosum; palpi labiales 3-articulati, articulo 2ndo reliquis crassiori, semiovali. Prothorax oblongus, antice et postice sub-

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truncatus, lateribus in medio angulato-productis; dorso bicostato: prosternum planum, inter pedes anticos angustatum, postice dilatatum. Scutellum minutum. Elytra rigida, oblonga, pronoto multo latiora, lateribus parallelis, apice rotundata; singulo bicostato, costis rectis spatiis intermediis transverse sulcatis. Mesosternum medio ad basim carinato, inter pedes intermedios dilatatum, planum, et in medio sulcatum. Metasternum subquadratum, utrinque ad basin sulco obliquo pro femora intermedia recipiendo, spatio inter coxas posticas lato, emarginato. Abdomen 5-articulatum; articulis duobus basalibus bicostatis, 3tio et 4to in medio marginis postici tuberculo semirotundo instructis, 5to semicirculari. Pedes modice elongati, graciles, compressi, tibiis omnibus inter basin et medium intus paullo dilatatis; tarsis heteromeris, articulis simplicibus spinulosis; ungues simplices.

Obs.—Primo intuitu hoc insectum singulare ad genus *Rhysodem* appropinquat, tarsis autem heteromeris facile distinguitur. Inter *Heteromera* locus ejus difficilime invenitur. Pronoto et elytris costatis *Adelostomam*, antennisque difformibus *Sarrotrium* nec non *Mylabrides* nonnullas simulat.

Rhysodina Mniszechii, Westw., Chevrolat.
(Pl. VI. fig. 4.)

Terreo-nigra, parum grisescens, opaca, capite punctato, antice coronato et biangulato, tuberculo parvo bifido inter oculos instructo, vertice in medio sulcato; pronoto transversim aciculato; elytris latitudine plus duplo longioribus, bicostatis, interstitiis inter costas striis duabus punctorum, sulcisque parvis transversis impressis notatis.

Long. corp. lin. 4½.

Habitat in Abyssiniâ. In Mus. Com. Mniszechii.

Family HELOPIDÆ?

Genus DERIDEA.

Genus *Nemognatham* primo intuitu simulans, at tarsorum unguibus simplicibus (et inde ad familiam diversam pertinens) differt.

Caput elongatum, horizontale, subrostratum, postice in collum breve angustum terminatum. Oculi laterales. Labrum porrectum, subquadratum, ciliatum, angulis anticis rotundatis. Mandibulæ elongatæ, corneæ, apice arcuatæ,

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acutæ, intus membranâ elongatâ instructæ. Maxillæ basi elongatæ, lobo apicali brevi, transverse setoso, lobo interno haud producto. Palpi maxillares elongati, articulo 1mo brevissimo, 3tio brevi, 2ndo et 4to elongatis, hoc compresso, apice suboblique truncato. Mentum crateriforme. Labium elongatum, profunde emarginatum, ciliatum. Palpi labiales graciles, articulis tribus fere æqualibus, ultimo graciliori. Antennæ capite vix longiores graciles, apice parum incrassatæ. Prothorax glaberrimus, conoideus, ante medium parum constrictus. Elytra parum elongata, apice rotundata, basi thorace multo latiora, parum rugosa. Pedes satis graciles, tarsis elongatis, simplicibus; unguibus longis, simplicibus.

Deridea Curculionides, Westw. (Pl. VII. fig. 4.)

Nigra, nitida, elytris fulvo-luteis, apice late nigris, nitidis, parum rugosis, punctis minutis in disco in lineas longitudinales dispositis.

Long. corp. lin. 3½—5.

Habitat Angola (Rogers). In Mus. Hopeiano Oxoniæ.

Family HELOPIDÆ.

Genus STYRAX, Westw.

Genus novum *Stenochiæ* et *Cyphonoto* affinis, at *Colliuridem* et *Tricondylam* inter *Cicindelidas* mirabiliter simulans.

Corpus elongatum, gracile, cylindricum. Caput parvum; trophi *Helopidarum*, palpis maxillaribus articulo ultimo magno securiformi. Oculi magni, antice in medio frontis coaliti. Antennæ prothoracis longitudine æquales filiformes, articulis 3tio et 4to reliquis gracilioribus. Prothorax capite paullo crassior elongatus, dorso antice bigibboso; pone medium paullo constrictus. Elytra prothorace latiora, elongata, dimidio basali transversim ruguloso, apicali lævi, punctato-striato. Pedes longi graciles, intermedii longissimi; tibiæ posticæ in maribus compressis et contortis, tarsis gracilibus.

Styrax Tricondyloides, Westw. (Pl. VII. fig. 1.)

Cyaneo-purpurea, capite et pronoto glabris, hoc postice transversim substriolato; femoribus castaneo-rufis, tibiis tarsisque obscurioribus.

Long. corp. lin. 7.

Habitat Penang et Singapore (Wallace). In Mus. Hopeiano Oxoniæ.

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Family CISTELIDÆ.

Genus BRATYNA, Westw.

Genus *Cistelidarum* antennis longis, palpis omnibus articulo ultimo securiformi, tibiisque posticis valde dilatato-inflatis.

Caput transversum, oculis maximis, in medio frontis conjunctis; angulis anticis lateralibus clypei dilatato-elevatis. Labrum transversum, angulis anticis rotundatis. Maxillæ lobo magno rotundo apicali intus ad basin dente instructo, lobo interno parvo ciliato; palpi maxillares articulis 2ndo et 3tio æqualibus obconicis, ultimo magno securiformi. Mentum transverso-quadratum, angulis anticis lateralibus acutis, parallelis, porrectis. Labium transversum, lateribus rotundis. Palpi labiales articulo ultimo securiformi. Antennæ elongatæ, ultra medium elytrorum attingentes, articulo 2ndo minuto, 3tio 1mi dimidium longitudine vix æquanti, 4to et reliquis elongatis, sensim attenuatis. Prothorax transversus, angulis anticis rotundis, sulco transverso postico. Elytra oblonga, apice rotundata, subconvexa, striato-punctata. Pedes 4 antici graciles; tibiæ 2 posticæ dilatato-inflatæ latæ, basi et apice sensim angustatis, tarsorum ungues serrati.

Bratyna apicalis. (Pl. VII. fig. 2.)

Fulvus, antennis pedibusque piceis, illis apice lutescentibus; elytris apice nigricantibus, pronoto opaco parce punctato, elytris punctato-striatis, striâ 1mâ scutellari abbreviatâ, 2dâ et 3tiâ ad basin conjunctis.

Long. corp. lin. 3.

Habitat Old Calabar. In Mus. Hopeiano Oxoniæ.

Family CANTHARIDÆ.

Genus DANERCES, Westw.

Genus novum ex insulis Malayanis *Nacerdi* et præsertim *Pseudolyco* Guérin affine, e quibus differt primo intuitu palpis maxillaribus articulo apicali in maribus longe bifido, antennisque articulis 3tio et tribus sequentibus dilatatis.

Corpus elongatum, elytris depressis parallelis, tricostatis. Caput antice porrectum, subrostratum, oculis integris lateralibus. Labrum horizontale transversum, angulis anticis lateralibus rotundatis. Mandibulæ oblongæ, apice incurvo,

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acuto bifido; intus membranâ setosâ instructâ. Maxillæ parvæ, lobis duobus setosis inermibus. Palpi maxillares elongati, articulo 1mo minuto, 2ndo longo ad apicem sensim crassiori, 3tio præcedenti multo breviori, ultimo in maribus in flagellis duabus elongatis setosis compressis diviso, externo curvato; hoc in fœminâ longitudine 2ndi elongato-obconico intus oblique truncato. Prothorax oblongus, lateribus fere parallelis. Mentum parvum, planum, oblongum, ante medium paullo dilatatum. Labium membranaceum, profunde emarginatum, setosum. Palpi labiales articulo ultimo elongato-trigono, apice intus oblique truncato. Antennæ elongatæ, articulis 3—7 dilatato-compressis, 8—11 gracilibus. Pedes graciles, longitudine mediocres, tarsorum unguibus intus ante medium denticulo parvo instructis.

In Mr. Wallace's private collection of Malayan Heteromerous *Coleoptera*, now in the Hopeian Museum at Oxford, were a number of specimens which at first sight seemed to belong to the genus *Pseudolycus* of Guérin, but which differ from the species of that genus as well as from *Nacerdes*, &c., in the remarkable structure of the maxillary palpi of the male. They may be divided into sections as follows—

A. Antennæ concolorous.
   a. Flagellæ of the maxillary palpi of the males equal: sp. 1—10.
   b. Ditto, unequal in size: sp. 11.
B. Antennæ with several of the terminal joints pale-coloured: sp. 12, 13.

The insects of the first subdivision agree entirely in their general form and structure, and it is with great doubt that I give them as distinct species, and yet I can scarcely conceive them to be varieties of a single extremely variable species.

Species 1. *Danerces luteicornis.*

Tota luteo-fulva, opaca, elytris (basi apiceque exceptis) nigricantibus, velutinis, antennis luteis; corpore infra luteo-fulvo, abdomine piceo, segmentorum marginibus lutescentibus.

Long. corp. lin. 4½.

Habitat insula Dorei (Wallace). In Mus. Hopeiano Oxoniæ.

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Species 2. *Danerces bipartita.* (Pl. VII. fig. 3.)

Nigricans, antennis palpisque nigris, prothorace luteo-fulvo, antice paullo obscuriori, scutello dimidioque postico elytrorum fulvis; pedibus nigris, femoribus basi et subtus fulvis; corpore infra luteo, abdomine piceo, segmentis luteo-marginatis.

Long. corp. lin. $5\frac{1}{3}$.

Habitat insula Dorei (Wallace). In Mus. Hopeiano Oxoniæ.

Species 3. *Danerces fraterna.*

Præcedenti similis; nigra, pronoto fulvo, angulis anticis lateralibus scutelloque nigris; elytris nigris usque pone medium, apicibus fulvis, colore fulvo utriusque elytri antice biundatis; capite infra luteo, thorace subtus cum abdomine et pedibus piceo-nigris; hoc luteo-bicingulato.

Long. corp. lin. $5\frac{1}{4}$.

Habitat insula Dorei (Wallace). In Mus. Hopeiano Oxoniæ.

Species 4. *Danerces fulvicollis.*

Nigricans, antennis et palpis nigris, capite supra piceo, pronoto et scutello fulvis; elytris nigris velutinis; capite et thorace infra luteo-fulvis, abdomine piceo, segmentis luteo-marginatis; pedibus nigricantibus, femoribus basi geniculisque fulvis.

Long. corp. lin. $5\frac{1}{4}$.

Habitat insula Dorei (Wallace). In Mus. Hopeiano Oxoniæ.

Species 5. *Dinerces picea.*

Tota picea, scutello lutescente, capite infra, thorace subtus femoribusque basi fulvis; antennis palpisque nigris, abdomine piceo.

Fœmina differt tibiis tarsisque lutescentibus.

Long. corp. lin. $4\frac{1}{2}$—$5\frac{1}{3}$.

Habitat insula Dorei.

Species 6. *Danerces nigra.*

Tota piceo-nigra, velutina.

Long. corp. lin. $5\frac{1}{2}$.

Habitat insula Dorei (Wallace). In Mus. Hopeiano Oxoniæ et Britann.

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Species 7. *Danerces apicalis.*

Nigra, pronoto, scutello, elytrisque usque ultra medium fulvis, horum colore nigro e fulvo semicirculariter separato; corpore toto infra cum abdomine et basi femorum omnium piceis, prosterno et capite infra lutescentibus.

Long. corp. lin. 5.

Habitat ins. Dorei (Wallace). In Mus. Hopeiano Oxon.

Species 8. *Danerces basalis.*

Nigra, maculâ inter antennas, pronoto (lateribus ante medium nigris exceptis), scutello et tertiâ parte basali elytrorum fulvis; pedibus nigris, dimidio basali femorum fulvo; corpore infra fulvo, abdomine piceo.

Long. corp. lin. $5\frac{1}{3}$.

Habitat ins. Dorei (Wallace). In Mus. Hopeiano Oxoniæ.

Species 9. *Danerces suturalis.*

Nigricans, capite antice luteo-piceo, medio partis posticæ pronoti, scutello, suturâque elytrorum fulvo-albidis; pedibus nigris, femoribus basi geniculisque pedum lutescentibus; corpore infra fulvo, abdomine piceo.

Variat strigâ suturali plus minusve distinctâ, corporeque subtus cum femoribus obscurioribus.

Long. corp. lin. $5\frac{1}{3}$.

Habitat insulis Dorei et Mysol (Wallace). In Mus. Hopeiano Oxoniæ.

Species 10. *Danerces fulva.*

Fulva, antennis fuscis, versus apicem sensim pallidioribus, palpis maxillaribus articulis 1 et 2 fulvis, hujus apice articulisque duobus apicalibus nigris, tarsis apice obscuris; corpore infra fulvo, mesosterno et lateribus metasterni piceis, femoribus duobus posticis strigâ piceâ notatis.

Long. corp. lin. $6\frac{1}{3}$.

Habitat insula Dorei (Wallace). In Mus. Hopeiano Oxoniæ.

Species 11. *Danerces biguttulus.*

Reliquis robustior et minus depressa, supra et subtus tota fulva, antennis nigris; elytris paullo ante apicem maculâ parvâ trigonâ laterali notatis, palporum maxillarium fulvorum flagello supero brevi conico, infero duplo longiori curvato.

Long. corp. lin. 5.

Habitat insula Batchian (Wallace). In Mus. Hopeiano Oxoniæ..

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Species 12. *Danerces nasalis.*

Nigra, parte anticâ capitis, pronoto (nisi angulis anticis late nigris) et triente basali elytrorum fulvis (suturâ exceptâ); antennis nigris, articulo 9no (et reliquis?) albido; pedibus piceo-nigris, femorum basi geniculisque lutescentibus; corpore infra piceo, pro et mesosternis lutescentibus.

Long. corp. lin. 5.

Habitat insula Batchian (Wallace). In Mus. Hopeiano Oxoniæ.

Species 13. *Danerces laticornis.*

Fulva, antennis nigris, articulis 3, 4 et 5 quam in cæteris speciebus latioribus; 8, 9 et 10 albidis gracilibus, 11mo piceo; palpis maxillaribus nigris, elytrorum triente basali fulvo, colore fulvo ad medium marginis lateralis extenso; parte reliquâ nigrâ; pedibus fulvis, tibiis 4 anticis nigricantibus, tibiarum 2 posticarum basi et apice obscurioribus; corpore infra fulvo, abdomine nigro nitido, tenue luteo-cingulato.

Var. Elytris fulvis, triente apicali tantum nigro.

Var. Elytris omnino fulvis.

Long. corp. lin. $4\frac{2}{3}$.

Habitat insula Aru (Wallace). In Mus. Hopeiano Oxoniæ.

Description of the Plates.

PLATE VI.

Fig. 1. *Moluris* (*Phanerotoma Rowleiana*). 1*a*, extremity of anterior tibia.
Fig. 2. *Moluris* (*Phanerotoma*) *gravida.*
Fig. 3. *Moluris procrustes.*
Fig. 4. *Rhysodina Mniszechii.* 4*a*, underside of insect; 4*a*, side view of head; 4*b*, antenna (terminal joints wanting); 4*c*, labrum; 4*d*, mandibles; 4*e*, maxilla; 4*f*, mentum; 4*g*, labial palpi; 4*h*, anterior tarsus; 4*i*, middle tarsus; 4*k*, posterior tarsus.

PLATE VII.

Fig. 1. *Styrax Tricondyloides.* 1*a*, side view of prothorax.
Fig. 2. *Bratyna apicalis.* 2*a*, maxilla; 2*b*, mentum, labium and labial palpi; 2*c*, one of the tarsal ungues.
Fig. 3. *Danerces bipartita.* 3*a*, mandible; 3*b*, maxilla of male; 3*c*, maxilla of female; 3*d*, mentum, labium and labial palpi; 3*e*, ungues.
Fig. 4. *Deridea Curculionides.* 4*a*, head seen in front; 4*b*, maxilla; 4*c*, mentum, labium and labial palpi; 4*d*, ungues.

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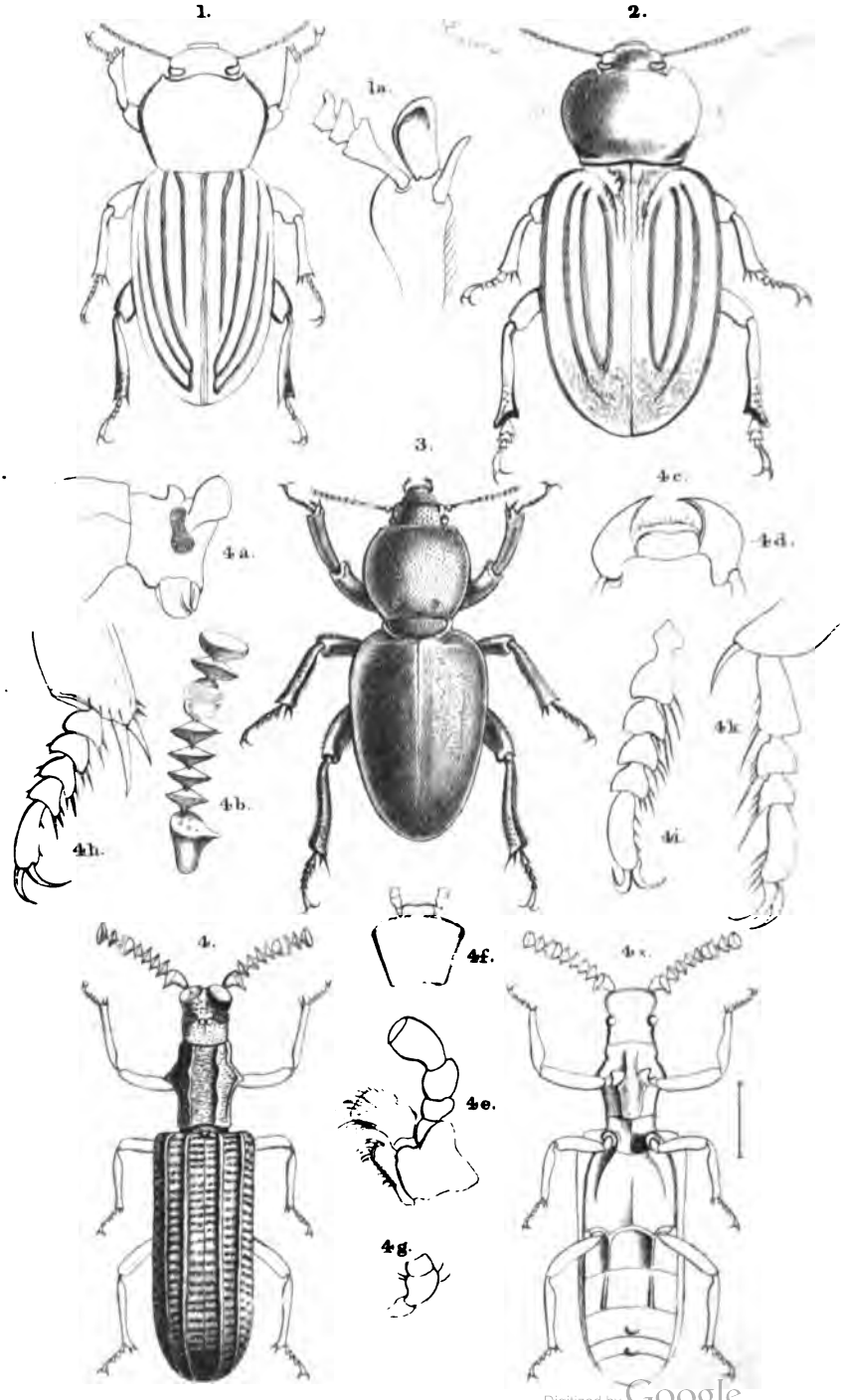

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Mintern Bros. imp.

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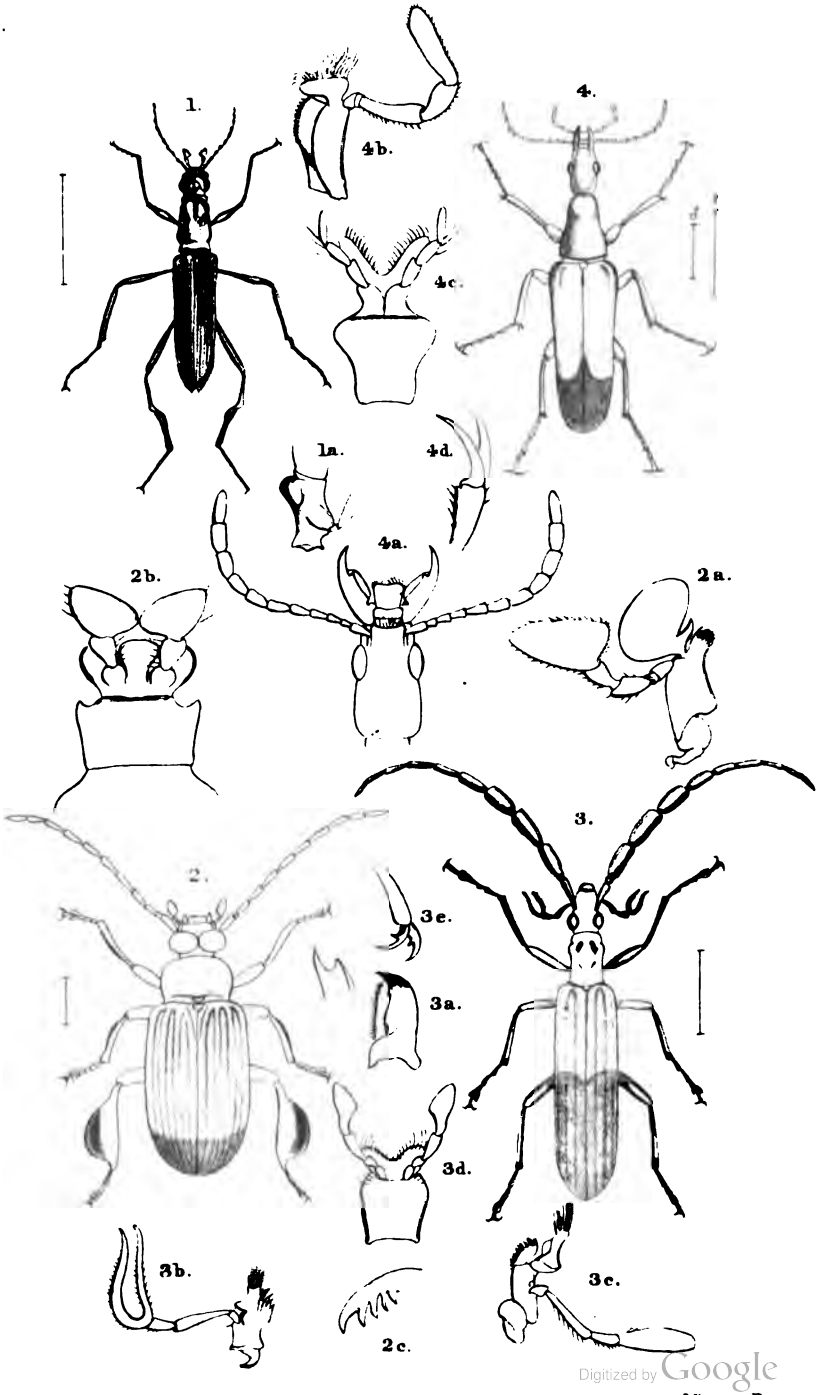

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XV. *On the species of* Rutelidæ *inhabiting Eastern Asia and the Islands of the Malayan Archipelago.* By J. O. Westwood, M.A., F.L.S., &c.

[Read 3rd May, 1875.]

The existence of species of animals or plants in parts of the world far removed from the geographical metropolis of the groups to which they respectively belong, is, at the present time, the subject of much interest in connection with the question of the diffusion of the different objects of creation on the earth's surface.

I therefore feel the less hesitation in calling the attention of the Members of the Entomological Society to the beautiful family of Lamellicorn beetles *Rutelidæ*, which are for the most part natives of the South American Continent, but of which certain species have been found in India and the Islands of the Eastern Archipelago; and the more so because the Transactions of the Society already contain descriptions of two of the most remarkable Eastern genera of this group, namely, *Parastasia* and *Peperonota*. Of the different sub-families into which the *Rutelidæ* have been divided, we find that the *Macraspides*, *Pelidnotides*, *Chrysophorides*, *Geniatides* and *Rutelides*, are entirely absent from the Old World.

The *Anoplognathides* are exclusively and the *Brachysternides* partially natives of Australasia, the Australian genera *Amblyterus* and *Schizognathus* belonging to the latter sub-family. In the sub-family *Chasmodiides*, *Phœnomeris*, illustrated from my drawings in the Transactions of the Zoological Society, is confined to South Africa and Madagascar. In the *Areodides*, *Idiocnema sulcipennis* of Falderman, Mem. Acad. St. Petersb. ii. p. 277, from Northern China, is the only Old World representative; whilst, in the *Adoretides*, *Trigonostoma mucoreum* inhabits Madagascar, and the species of *Adoretus* are widely distributed over Asia, Africa and the Eastern Islands.

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There remain only the *Parastasiides*, to which belong the typical genus *Parastasia*, *Peperonota*, and the three other genera which are described below.*

Parastasia, Westw.

(Sectio 2. *Barymorpha*, Guérin-Méneville.)

In addition to the species of this genus, described in my monograph in the fourth volume of the Transactions of the Entomological Society (1841), a number of species have been published by M. Snellen van Vollenhoven, in the Tijdschrift Ent. Nederlands, vol. vii. p. 1864; by Erichson, in Trans. Ent. Soc. London, iv. 1845; Blanchard, in the Catal. of the Lamellicorns of the Jardin des Plantes (*P. rubrotessellata*, *rugosicollis* and *rufolimbata*); M. Candeze, in the Coleopterologische Hefte, 1869 (*P. basalis*); and M. Montrozier, in the Annales Soc. Agr. Lyons, vol. vii. (*P. Percheronii* and *bimaculata*).

Peperonota, Westw.

The genus is still confined to the single rare species *P. Harringtonii*, described and figured by me in the Transactions of the Entomological Society, vol. iv. pl. 22, fig. 1, and Lacordaire, Genera (Atlas, pl. 34, fig. 1), from the Himalayas.

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* In addition to the species mentioned above in the text, I noticed in the magnificent collection of Westermann, now in the Royal Museum of Copenhagen, three other apparently undescribed insects from India, belonging to the *Rutelidæ*, namely—

Aglae rutilans, Reiche, MSS. from Assam; a small insect, with brilliant copper elytra;

Callisthenes (? *Callisthenes* = *Anomala* pars) *consularis*, Blanchard, from Assam; small, narrow and dark green; and

Callisthenes, sp. nov., from Bengal; of the size of *Euchlora viridis*, green, but more polished.

The genus *Cælidia*, of Dejean's Catalogue, 3rd ed., still uncharacterized, consists of two species from New Guinea, namely, *Melolontha marginata*, Bdv. Voy. Astrolabe, pl. 6, fig. 17, and *C. nigromaculata*, Blanchard and Hombron, Voy. au Pôle Sud, pl. 7, fig. 1.

The genus *Tropiorhynchus* of Blanchard, Coll. Mus. Paris, p. 176 (*Dinorhina*, Lacordaire), belongs to the *Anisoplia* group. It contains one Persian and one Nepalese species, the latter being *An. Orientis*, Newman, Ent. Mag. v. 384.

The genus *Singhala*, Blanchard, formed of several Eastern species (*Anomala Dalmanni*, Gyllenhal, Schönh.), from India, belongs to the *Anomala* group.

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RUTELARCHA, C. Waterhouse (Ent. M. Mag. 1874, August, p. 53.)

(Pl. VIII. fig. 1.)

Corpus breve, crassum, convexum, glabrum.

Caput clypeo trigono, aciculato-strigoso, apice sub-bifido. Mandibulæ subtrigonæ, apice incurvo integro, angulo medio interno parum prominente; spatio basali molari oblique strigatâ. Maxillæ lobo apicali curvato apice subacuto, lobo interno dentibus 4, majori composito, denticulis tribus terminato. Palpi omnes breves, graciles. Mentum oblongum vel crateriforme, lateribus extus rotundatis, antice profunde emarginatum ibique impressum. Antennæ 10-articulatæ, capitulo elongato gracili triarticulato. Prothorax lateribus rotundatis, angulis posticis lateralibus acutis; basi in medio supra scutellum semicirculariter productum disco glabro, lateribus concentrice aciculato-strigosis. Elytra brevia, subglobosa. Pedes breves, tibiis anticis apice tridentatis. Tarsi breves, crassi, ungue uno simplici acuto, altero vero parum majori et bifido. Metasternum ultra pedes intermedios porrectum.

Rutelarcha 4-maculata, Waterh. l. c. supra.

Capite et disco pronoti nigris, illo supra strigo-aciculato, hujus marginibus lateralibus fulvis maculâ parvâ rotundâ nigrâ notatis, lateribus disci nigri aciculato-strigosis, strigis circulariter dispositis; scutello nigro, elytris fulvo-testaceis, striato-punctatis, punctis pone medium evanescentibus, singulo maculâ parvâ rotundâ subhumerali, alterâque magnâ submediâ nigris: corpore infra pedibusque aurantio-fulvis, nigro-variegatis; trochanteribus posticis tarsisque nigris.

Long. corp. lin. 8; lat. elytr. lin. 4½.

Habitat Penang. In Mus. Britann. (e Mus. Banks.) et Hopeiano Oxoniæ (Wallace).

Pl. VIII. fig. 1, *Rutelarcha 4-maculata* slightly magnified; 1*a*, antenna; 1*b*, 1*c*, mandible in different positions; 1*d*, maxilla; 1*e*, teeth of inner lobe; 1*f*, mentum and labial palpi; 1*g*, metasternum seen from beneath; 1*h*, ditto seen sideways; 1*i*, anterior tarsus; 1*k*, ungues of posterior tarsus.

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LUTERA, gen. nov.

Corpus oblongo-ovatum, convexum, glabrum, parce punctatum.

Caput subtrigonum, clypei apice bifido. Mandibulæ crassæ, trigonæ, apice subito incurvo acuto, dente medio plano bifido, spatio basali molari transverso sulcato. Maxillæ lobo externo in unguem acutum producto, interno dentibus 3—4 (uno e denticulis tribus parvis composito). Palpi maxillares parvi, articulo ultimo majore et parum crassiori. Mentum planum crateriforme, margine antico fere recto. Antennarum clavâ longâ tenui. Prothorax transversus, lateribus roundatis, basi latitudine humeris elytrorum æquali, margine postico parum supra scutellum producto. Elytra subovata, in medio thorace parum latiora, punctato-striata, punctis parum profundis et irregulariter difformibus. Tibiæ anticæ ad apicem tridentatæ, posticæ 4 margine externo fere inermi. Tarsi ungue unico integro, altero acute bifido. Metasternum inter pedes medios vix porrectum apice ejus, lateraliter viso, ante basin pedum parum apparente.

Lutera luteola. (Pl. VIII. fig. 2.)

Fulvo-lutescens, nitida, parum punctata, marginibus capitis, guttis duabus frontalibus, alterisque 4 ante medium pronoti transverse positis margineque scutelli castaneis; elytris guttis duabus ante medium alterisque duabus fere obsoletis subapicalibus pallidius castaneis: corpore infra, tibiis tarsisque maculisque magnis in medio femorum, marginibusque segmentorum ventralium castaneo-brunneis; his basi podiceque fulvo-luteis.

Long. corp. lin. $8\frac{3}{4}$; lat. elytr. medio lin. $4\frac{1}{2}$.

Habitat Sarawak, Borneo (Wallace). In Mus. Hopeiano Oxoniæ.

Pl. VIII. fig. 2, *Lutera luteola* slightly magnified: 2*a* and 2*b*, mandible in different positions; 2*c*, maxilla; 2*d*, mentum and labial palpi; 2*e*, terminal joint of four posterior tarsi; 2*f* and 2*g*, metasternum seen from beneath and sideways.

CYPHELYTRA, C. Waterhouse.

(Cistula Entomologica, May, 1875, p. 366.)

Corpus breve, crassum, dorso parum depressum, elytris pone medium paullo dilatatis, fere glabrum, signaturis nigris elytrorum rude punctatis exceptis.

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Caput trigonum, clypei apice bifido. Antennarum clavâ longâ et tenui. Mandibulæ apice incurvo acuto dentibus duobus ad basin ejus marginis interni; tabulâ molari transverse ovatâ strigatâ. Maxillæ lobo apicali acute unciformi, edentato, lobo interno ad apicem dentibus tribus parvis acutis, medio e denticulis tribus parvis composito. Palpi maxillares articulo ultimo multo crassiori. Mentum subcrateriforme, apice subtus angustato, longe setosum, palpis labialibus articulo ultimo crassiori. Prothorax lateribus rotundatis, fere latitudine humerorum elytrorum æqualibus, margine postico in medio supra scutellum rotundato producto. Elytra brevia subconvexa, pone medium latiora. Metasternum simplex, haud elevatum, nec antice porrectum. Pedes satis crassi, tarsis tibiarum longitudine, et gracilioribus, ungue uno integro, altero crassiori bifido.

Cyphelytra ochracea, C. Waterhouse, l. c.

(Pl. VIII. fig. 3.)

C. capite et pronoto fulvis, glabris, capite strigâ tenui transversâ inter antennas guttisque duabus frontalibus; pronoto vittâ mediâ antice dilatatâ guttisque 8 magnitudine variis nigris; elytris albido-lutescentibus, margine scutelli, suturâ maculis duabus ovalibus versus basin signaturisque variis, cum præcedentibus faciem hominis rude simulantibus, nigris, his signaturis punctis rudibus notatis: corpore infra albido-lutescenti, nigroque variegato; femoribus posticis crassioribus, maculâ magnâ piceâ notatis; tibiis tarsisque nigris, illis flavo-maculatis.

Long. corp. lin. 7; lat. elytr. ultra medium lin. 4.

Habitat in regione Himalayana Indiæ. In Mus. Britann. etiam in Mus. Hopeiano Oxoniæ.

Pl. VIII. fig. 3, *Cyphelytra ochracea* magnified; 3*a* and 3*b*, mandible seen in different situations; 3*c*, maxilla; 3*d*, mentum and labial palpi; 3*e* and 3*f*, metasternal process seen sideways and from beneath; *ms.*, mesosternum; *tr.*, trochanter; *cx.*, coxa; *fm.*, femur of middle legs; *mt.*, metasternal process; 3*g*, extremity of anterior tarsus; 3*h*, ditto of middle and hind tarsus.

URLETA.

Facie *Ometidis*, processu sternali *Macraspidis*, capiteque bicoronato *Dicerotis* facile dignoscitur typus hujus generis novi.

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Corpus parvum, glabrum, elytris subdepressis, apice rotundatis, dorso variolosis, striato-punctatis.

Caput porrectum, clypeo excavatione circulari anticâ, angulis ejus anticis in cornua duo, parum reflexa, porrecta. Mandibulæ porrectæ, rectæ, angustæ, apice acute et oblique truncatæ, spatio molari parvo subovato in medio concavo. Maxillæ magnitudine mandibularum, lobo apicali spinuloso et in uncum acutum producto, medio ejus marginis interni spinâ unciformi armato; palpi maxillares articulo ultimo magno elongato-ovali. Mentum crateriforme, antice subito angustatum, margine antico fere recto spinuloso. Palpi labiales graciles, breves. Antennæ mediocres, clavâ satis magnâ. Pronotum margine postico antico duplo latiori, lateribus ex apice ultra medium recte-obliquis; postice lateribus subparallelis, margine postico parum rotundato producto. Scutellum mediocre. Elytra pronoto vix latiora, supra parum depressa, apicibus rotundatis. Pygidium detectum. Metasternum inter pedes intermedios antice porrectum, sulco longitudinali medio instructum; mesosterni processu in apicem ejus insidente attenuato, recurvo. Pedes antici breves, crassi; tarsorum perbrevium unguibus in individuo nostro unico (masculino?) difformibus, uno crassiori integro, altero gracili acuto curvato simplici. Ungues pedum quatuor posticorum etiam dissimiles, uno integro, altero acute bifido. Pedes 4 postici subgraciles, tarsis longitudine tibiarum.

Urleta Ometoides. (Pl. VIII. fig. 4.)

Castaneo-rufa, nitida, capite cum antennis nigro, cicatricoso, cicatricibus parum profundis, pronoto glaberrimo, castaneo-rufo, lateribus læviter punctatis impressione parvâ satis profundâ utrinque versus angulos laterales; elytris luteo-flavidis, suturâ et basi cum scutello nigris, disco præsertim basin versus varioloso, striato-punctatis; abdomine cum pygidio et pedibus castaneo-rufis, metasterno cum processu sternali nigro.

Long. corp. lin. 4½.

Habitat in Sumatra (Wallace). In Mus. Hopeiano Oxoniæ.

Pl. VIII. fig. 4, *Urleta Ometoides* magnified; 4*a*, front of head; *md.*, mandibles; 4*b*, 4*c*, mandible in different positions; 4*d*, maxilla; 4*e*, mentum and labial palpi; 4*f*,

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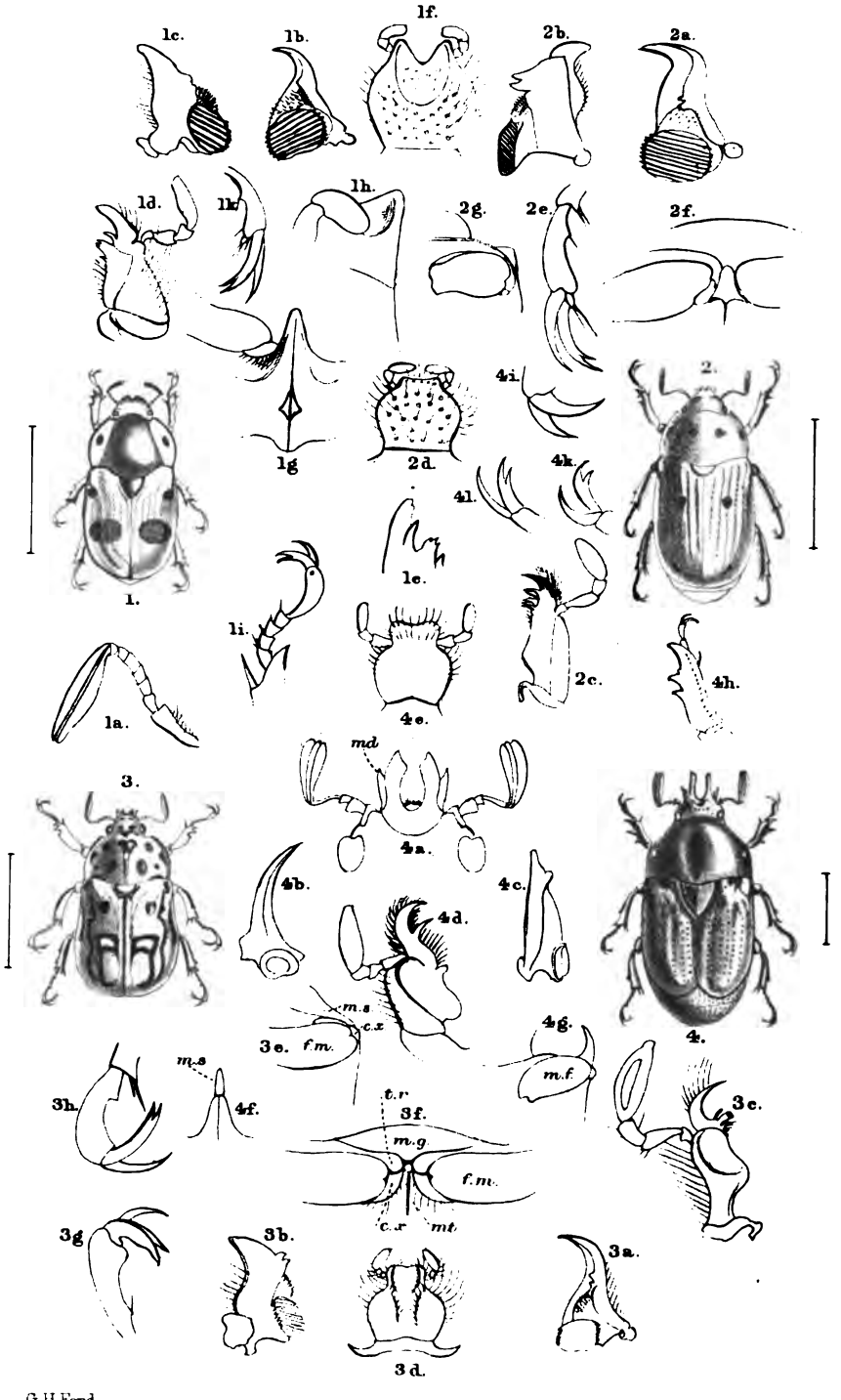

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Mintern Bros. imp.

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4*g*, sternal process seen from below and sideways; *ms.*, mesosternal apex; *mf.*, middle femur; 4*h*, fore tibia and tarsus; 4*i*, ungues of fore-foot; 4*k*, ditto of middle foot; 4*l*, ditto of hind foot.

Description of Plate VIII.

Fig. 1. *Rutelarcha 4-maculata.*
Fig. 2. *Lutera luteola.*
Fig. 3. *Cyphelytra ochracea.*
Fig. 4. *Urleta Ometoides.*

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XVI. *Description of a new genus of Clerideous* Coleoptera, *from the Malayan Archipelago.* By J. O. Westwood, M.A., F.L.S., &c.

[Read 7th June, 1875.]

Allochotes.

Genus novum e familiâ *Cleridarum*, forma omnino insolita, semiglobosa, coccinelliforme, glaberrimum, setosum. Caput pronum, supra vix visibile, margine antico emarginato. Oculi magni, antice late emarginati. Labrum parvum, transversum, vix porrectum, antice setosum. Mandibulæ validæ, elongato-trigonæ, apice forte bidentatæ, intus lobo elongato membranaceo setoso ante medium instructæ. Maxillæ parvæ, lobis duobus elongatis simplicibus apice setoso, basi transverso corneo; palpi maxillares articulo ultimo elongato-securiformi. Mentum parvum, transversum, ligulâ elongatâ parallelâ; labium profunde emarginatum, setosum. Palpi labiales articulo ultimo elongato-securiformi. Antennæ vix thoracis longitudine, 11-articulatæ, articulo 1mo oblongo, 2ndo minuto, 3tio longiori gracili, 4to ad 10um sensim paullo latioribus, 11mo majori ovali. Pronotum semicirculare, lateribus rotundatis. Prosternum brevissimum in medio inter coxas anticas haud prominens. Mesosternum brevissimum, simplex, inter coxas medias triangulum minutum antice efficiens. Metasternum transversum, simplex. Abdomen subconicum, e segmentis sex formatum. Pedes simplices, parum elongati; tarsis omnibus 4-articulatis, articulis tribus basalibus subtus in lobum membranaceum bifidum productis. Elytra fere hemispherica, glaberrima, setigera.

Pl. IX. fig. 1*a*, head and antenna; 1*b*, mandible; 1*c*, maxilla; 1*d*, mentum, labium and labial palpi; 1*e*, prothorax seen from below; 1*f*, meso- and meta-sterna and abdomen; 1*g*, tarsus sideways; 1*h*, tarsus from above.

Obs.—E *Chorecine advena* Pascoe, Journ. of Entomol. i. 49, pl. 2, fig. 2, differt antennis apice incrassatis, thoracis formâ latiori, elytrisque glaberrimis.

Species 1. *Allochotes bicolor.* (Pl. IX. fig. 1.)

Aurantiaco-fulvus, pronoto fulvo-setoso, elytris nigro-viridibus punctatis, nigro-setosis; corpore infra cum pedibus et antennis fulvis.

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Long. corp. lin. 3; lat. elytr. lin. $2\frac{3}{4}$.

Habitat Makassar (Wallace). In Mus. Hopeiano Oxoniæ.

Varietas? (*Allochotes Mortica*) e præcedenti differt magnitudine paullo minori elytrisque æneo-viridibus, luteo-setosis.

Habitat in insulâ Morty (Wallace). In Mus. Hopeiano Oxoniæ.

Species 2. *Allochotes apicalis.*

Fulva, elytris nigro-æneis punctatis, nigro-setosis, triente apicali fulvo, luteo-setoso.

Long. corp. lin. $3\frac{1}{4}$.

Habitat in Nova Guinea (Wallace). In Mus. Hopeiano Oxoniæ.

Species 3. *Allochotes Chrysomelina.*

Fulva, elytris chalybæis, griseo-setosis, crebre punctatis.

Long. corp. lin. $2\frac{1}{2}$.

Habitat in insulâ Dorei (Wallace). In Mus. Hopeiano Oxoniæ.

Species 4. *Allochotes Eubrioides.*

Supra nigra, nitida, vix punctata, elytrorum lateribus dense griseo-setosis; corpore infra cum pedibus et antennis lutescenti; tibiis infuscatis; elytris paullo minus rotundatis.

Long. corp. lin. $2\frac{3}{4}$.

Habitat Sumatra (Wallace). In Mus. Hopeiano Oxoniæ.

Species 5. *Allochotes Coccinella.*

Tota fulvo-ochracea, glabra, punctata, fulvo-setosa.

Long. corp. lin. 3.

Habitat Ceram (Wallace). In Mus. Hopeiano Oxoniæ.

Species 6. *Allochotes fulvescens.*

Tota fulva, punctata, fulvo-setosa, elytrorum humeris haud antice porrectis, rotundatis.

Long. corp. lin. $2\frac{1}{2}$.

Habitat insula Batchian (Wallace). In Mus. Hopeiano Oxoniæ.

Species 7. *Allochotes Scymnoides.*

Minuta, fulva; elytris æneis, glaberrimis, punctatis, nigro-setosis.

Long. corp. lin. $1\frac{3}{4}$.

Habitat Singapore (Wallace). In Mus. Hopeiano Oxoniæ.

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XVII. *Description of a new species of* Lucanidæ, *with a note on* Lissotes obtusatus. By J. O. Westwood, M.A., F.L.S., &c.

[Read 5th July, 1875.]

Genus Scortizus, Westw.

Scortizus pulverosus, n. s. (Pl. IX. fig. 2.)

Niger, capite et pronoto sublævibus; elytris punctato-striatis interstitiis punctatis, pulvere plumbeo cupreoque certo situ nitenti, indutis; mandibulis capite vix longioribus rectis, intus 4-sinuatis.

Long. corp. lin. 7 (mandibulis inclusis).

Habitat prope Chiquinquivia Cordilleræ orientalis—La Luzua (Steinheil)—altitudine 8,800 ped. In Mus. Dom. Steinheil ad Dom. Parry communicatus.

The head is nearly quadrate, with the anterior lateral angles strongly rounded off, and with a deep emargination in the middle of the fore margin. The eye is anteriorly half-incised by the lateral canthus, with a deep impression in front of the eye. The front half of the head is obliquely depressed, the dorsal portion is nearly smooth, but the sides, especially behind the eyes where they are slightly swollen, are punctuate. The mandibles are about as long as the head, nearly straight, narrow, with the inner margin 4-sinuated, the intervening spaces forming very obtuse teeth, the basal one being the strongest.

The pronotum is transverse, broader than the head and elytra, the anterior angles acute; the sides rather converging in the middle, with the lateral posterior angles acute, each preceded by a rather deep emargination. The disc is nearly smooth, with a slight raised lateral margin, and with an impression in the middle, in front of the scutellum. The hind margin is very slightly sinuated. The elytra are of moderate length, narrower than the prothorax, with a sharp point at the anterior angle of each, opposite the pointed hind angle of the prothorax. They are punctate-striate, the interstices with still finer punctures; and are covered with a pulverescence of a slaty

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or leaden-blue colour, which in certain points of view has a copper-coloured gloss. This pulverescence is most easily abraded at the slightest touch, showing the black colour of the elytra beneath.

The legs are rather slender; the anterior tibiæ with two terminal spines on the outer edge, the preceding portion of the edge being slightly serrated.

Beneath black and glossy, the head and thoracic portions slightly, the abdominal segments more strongly, punctured.

Lissotes obtusatus, Westw.

Major F. J. S. Parry has recently received from M. Henri Deyrolle several species of a *Lissotes* from Tasmania as a new species, but which I cannot distinguish from the well known and common *L. obtusatus*, on a very careful comparison with the type specimens of the latter. In one of the males sent the mandibles are nearly identical; the notch near the tip of the inner margin is however rather wider, and the tubercle at the base of the broad inner tooth is rather more elevated. The two impressions on the disc before the middle of the pronotum are a little deeper, and the elytra are slightly elevated round the scutellum. The punctation throughout is also somewhat stronger. In another male, also sent by M. H. Deyrolle, the apical tooth of the mandibles is more distinct, in consequence of the broad tooth having its anterior angle obtusely truncate. The impressions on the pronotum are wanting, and the elytra round the scutellum are not elevated.

I can only regard these modifications as individual variations, and not as indicating distinct species.

Description of Plate IX.

Fig. 1. *Allochotes bicolor.*
Fig. 2. *Scortizus pulverosus.*

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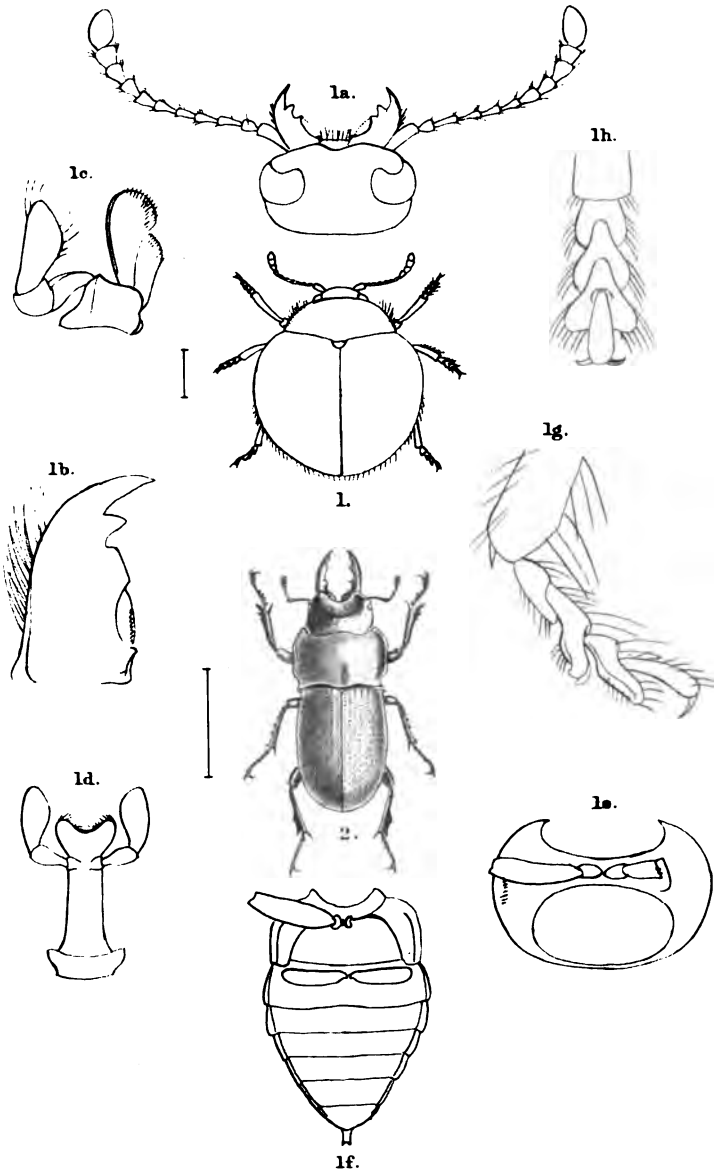

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XVIII. *Synopsis of British* Hemiptera-Heteroptera. By Edward Saunders. Part II.

[Read 3rd November, 1875.]

TINGIDIDÆ.

I. Side lobes of the face produced into two elongate, horn-like processes .. .. *Piesma.*

II. Side lobes of the face not produced.

A. Sides of elytra not reticulated.. .. .. *Serenthia.*

AA. Sides of elytra reticulated.

B. Longitudinal ribs of elytra subparallel, not united on the disk .. .. *Campylostira.*

BB. Longitudinal ribs of elytra united on the disk.

C. Disk of the elytra, between the ribs, flat.

D. Internal rib of the elytra distinctly angulated .. .. *Monanthia.*

DD. Internal rib of the elytra not angulated, generally curved, but in undeveloped specimens straight.

E. Antennæ slender, apical joint thickest .. *Acalypta.*

EE. Antennæ stout, very hairy or rugose, apical joint not thicker than the rest .. .. *Dictyonota.*

CC. Disk of elytra between the ribs raised .. *Derephysia.*

Piesma.

A. Frontal processes curved and converging.

a. Sides of thorax not emarginate .. .. *quadrata.*

b. Sides of thorax emarginate .. .. *Laportei.*

AA. Frontal processes straight and short, not converging .. .. *capitata.*

1. *quadrata*, Fieb. Fig. Dougl. & Scott, Brit. Hem. pl. viii. fig. 9.

Grey or reddish-brown, mottled on the elytra with paler spots. Frontal processes much produced, curved inwards and slightly upwards at the apex. Thorax impressed in front, raised posteriorly, very deeply punctured, with three longitudinal carinæ extending across the anterior impression. Sides dilated in front. Scutellum dark, its apex pale. Elytra largely punctured; costæ very prominent;

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disk, and especially the sides, more or less mottled or spotted with darker colour.

Length 1½ line.

Common by sweeping and at the roots of herbage by the sea-shore.

2. *Laportei*, Fieb. Fig. Fieb. Ent. Mon. tab. ii. fig. 17.

Grey, sometimes dull brown, more or less spotted on the elytra with darker colour. Frontal processes much produced, curved inwards and sometimes slightly upwards at the apex. Thorax pale in front, deeply punctured, impressed in front, with two short carinæ across the impression. Sides foliaceous and meshed in front, deeply emarginate near the middle. Elytra largely punctured; costæ very prominent, brown or grey, with darker spots. Shoulders, each with a pale spot, sometimes very conspicuous.

Length 1—1¼ line.

Generally distributed; found by sweeping, &c., and under herbage.

3. *capitata*, Wolff. Fig. Fieb. Ent. Mon. tab. ii. fig. 18.

Very like the preceding, of which I believe it to be a variety: differs in being of a duller colour, with the spots hardly visible, in the frontal processes being straight and not converging at the apex and in the slightly less emarginate sides to the thorax.

Length 1—1¼ line.

Occasionally by sweeping, &c. and under herbage.

Serenthia.

1. *læta*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. ix. fig. 1.

Small, somewhat elongate, largely and closely punctured, in a cell-like manner. Head, antennæ and thorax black. Scutellum and elytra ochreous-white, legs reddish.

Length 1—1½ line.

Local, but common where it occurs, by sweeping. Reigate Hill, &c.

Campylostira.

1. *brachycera*, Fieb. Fig. Dougl. & Scott, Brit. Hem. pl. ix. fig. 6.

Small, somewhat elongate. Head brownish-black.

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Thorax punctured, brown, with three carinæ, the lateral ones abbreviated; sides with two rows of meshes in front, one behind. Elytra with large, clear meshes, and with a very strong dorsal costa; the ribs between the meshes brownish-red; the elytra do not meet at the base, so that the abdomen is visible. Legs and antennæ pale; apex of former darker.

Length 1 line.

In moss, &c.; not uncommon.

Monanthia.

I. Sides of thorax more or less reflexed, very thin, generally with clear meshes.
  A. Sides of thorax and elytra with projecting hairs .. .. *reticulata.*
  AA. Sides of thorax and elytra without projecting hairs.
    B. Margins of thorax wide, with several rows of meshes.
      a. Sides of thorax and elytra with four rows of meshes .. .. *ampliata.*
      b. Sides of thorax and elytra with three rows of meshes.. .. .. *cardui.*
    BB. Margins of thorax very narrow, with a single row of meshes near the posterior angles .. *costata.*

II. Sides of thorax not reflexed, more or less inflated.
  B. The inflated sides of the thorax bearing rows of meshes.
    C. Thorax with three carinæ extending from the base to the frontal hood.
      a. Elytra with three rows of meshes at the sides .. .. *quadrimaculata.*
      b. Elytra with one row of meshes at the sides *dumetorum.*
    CC. Side carinæ of thorax abbreviated by the lateral inflations .. .. *humuli.*
  BB. Sides of thorax without meshes, each bearing a sort of bubble-like excrescence, reaching to the central carina .. .. .. *simplex.*

1. *reticulata*, H.-Scff. Fig. H.-Scff. Wanz. Ins. iii. fig. 288.

Brownish-grey, covered with upright hairs. Sides of the thorax much dilated and rounded at the middle, with three to four rows of large meshes; disk with three nearly straight costæ. Elytra with fine meshes on the disk. Sides much expanded, with three rows of large clear

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meshes. Side margins with fine projecting hairs. Legs and antennæ hairy.

Length 2 lines.

Very rare; Monkswood, Huntingdon.

2. *ampliata*, H.-Scff. Fig. Dougl. & Scott, Brit. Hem. pl. ix. fig. 3.

Grey, very finely pubescent. Thorax with the lateral margins largely expanded, especially in front, with five rows of small irregular meshes; disk with three nearly straight costæ. Elytra with five rows of very small meshes at the sides, and with a wide black band crossing them a little above the middle, and with numerous other black spots and lines. Antennæ red, apex black.

Length 2 lines.

Not rare, by sweeping, &c.

Var.? *similis*, Dougl. & Scott.

Shorter than typical form. Antennæ shorter. Sides of the thorax rounded to the hood in front, instead of being angulated. These characters, however, are not to my mind sufficient to establish a species on only two examples, as in all other respects their form is identical with *ampliata*.

3. *cardui*, Linn. Fig. H.-Scff. Wanz. Ins. iv. 127, fig. A.

Grey, more or less spotted, and mottled with black. Thorax raised in front, with the sides gradually rounded to the anterior margin, with three rows of very small meshes; disk with three nearly straight longitudinal carinæ, spotted with black; on the meshes there are also some black spots. Elytra: disk with fine meshes more or less clouded with brown or black; sides with three rows of meshes, traversed by a wide spot just above the middle, and several narrow line-like spots along their entire length; the wide spot at the middle often joins the dark colour of the disk, making a sort of transverse band. Antennæ red, apex black.

Length 1½ line.

Very common on thistles.

4. *costata*, Fab. Fig. H.-Scff. Wanz. Ins. iv. fig. 390.

Pale ochreous; legs and antennæ rather of a browner tint, apex of latter black. Thorax much narrowed in

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front, and convex behind. Sides sinuate, narrowly and sharply reflexed, a single row of meshes visible by looking sideways at the reflexed edge. Disk with three straight costæ. Elytra much wider than thorax. Sides rounded, with three rows of meshes, with occasional brown transverse streaks crossing them.

Length 2 lines.

Not common; Somerset; Bushey, Herts; Reigate; &c.

5. *quadrimaculata*, Wolff. Fig. H.-Scff. Wanz. Ins. iv. 125, fig. A.

Brown or reddish-brown. Elytra with an elongate marginal spot at the base, and a second near the apex on each side, white. Thorax with three well-marked longitudinal carinæ. Sides slightly inflated with honeycomb-like meshes. Elytra with three rows of meshes at the sides in front; four in the middle on the brown portion, and two behind. Apex of discal carina white. Legs and antennæ reddish. Apical joint of latter darker.

Length $1\frac{3}{4}$ line.

Rare. Dorsetshire, on old apple trees.

6. *dumetorum*, H.-Scff. Fig. H.-Scff. Wanz. Ins. iv. fig. 391.

Brown or reddish-brown. Elytra with a basal spot, and a marginal spot near the apex, white.

Very like the preceding, but differs in having the inflations on the margins of thorax narrower, and their inner margins parallel to the sides, and in having only two rows of meshes on the sides of the elytra in front and one row behind; its size is also smaller.

Length $1\frac{1}{2}$ line.

Old whitethorns, widely distributed; Oxfordshire, Lee, Southampton, Glanvilles Wootton, Chobham.

7. *humuli*, Fab. Fig. H.-Scff. Wanz. Ins. iv. fig. 361 (*convergens*).

Ochreous with occasional black markings. Head black. Thorax with the inflated meshed portions wide, their inner edges parallel to the lateral margins; disk with three keels, the side ones interrupted at about half their length by the lateral inflations. Elytra more or less marbled with darker colour, exterior discal carina with two black spots, one in the middle and one near the apex; lateral

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margins with one row of meshes in front, two behind. Antennæ and legs pale, apex of former black.

Length 1½—1¾ line.

Damp places, by sweeping.

8. *simplex*, H.-Scff. Fig. Panz. Faun. Germ. 118, 21.

Reddish-brown. Head black. Thorax with a central carina, on each side of which, and almost touching it, is a rounded, bubble-like inflation, extending to the lateral margin; base of the thorax with two short carinæ converging towards the central one, but interrupted by the inflations. Elytra with fine round cells on the disk; lateral margins with one very narrow row of meshes.

Length 1½—2 lines.

Rare. Isle of Wight, Bexley, &c.

Derephysia.

1. *foliacea*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. ix. fig. 4.

Body testaceous. Thorax darker; sides of latter much expanded and reflexed, with two rows of large clear meshes; central crest with one row, hood with four meshes; costæ between the meshes testaceous. Elytra largely and clearly meshed, with two rows at the sides; disk of each much raised longitudinally; legs and antennæ ferruginous.

Length 2 lines.

Occasionally by sweeping, &c.; abundant at Mickleham in August, in ivy growing on palings. Dougl. & Scott.

Dictyonota

A. Antennæ black.
  a. Antennæ with long projecting hairs .. .. *crassicornis.*
  b. Antennæ without projecting hairs .. .. *strichnocera.*
AA. Antennæ pale brown .. .. *fuliginosa.*

1. *crassicornis*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. ix. fig. 5.

Grey. Head dark brown, with two projecting spines in front on the vertex and one on each side at the base of the antennæ, between them and the eyes. Sides of thorax largely dilated and angulated in front, with three to four large rows of meshes; longitudinal crests each with one row. Elytra clearly meshed, with two rows of meshes at

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the sides. Underside of thorax and antennæ black. Abdomen and legs brown.

Length 2 lines.

In moss, and occasionally by sweeping.

2. *strichnocera*, Fieb. Fig. Fieb. Ent. Mon. pl. viii. fig. 4—7.

Narrower than the preceding; sides of the thorax scarcely dilated at all in front, with only two rows of meshes; longitudinal crests each with one row. Elytra with the discal cell much shorter than in *crassicornis*. Sides with two rows of clear meshes. Beneath entirely black. Thighs black, brown at the apex; tibiæ and tarsi pale. Antennæ with the second joint very long and thick; very rugose, with adpressed hairs.

Length 2 lines.

Moss, &c.

3. *fuliginosa*, Cost. = *Fieberi*, Dougl. & Scott. Fig. Ent. Month. Mag. iv. pl. ii. fig. 2.

A larger insect than either of the preceding, with much thinner antennæ, and of a generally browner colour. Head black. Thorax pale, darker in front; sides considerably expanded and angulated anteriorly, with two rows of meshes near the base, three near the front angles; longitudinal crests, each with one row. Elytra with large meshes; discal cell very short. Sides with two rows of meshes, slightly sinuate behind the middle. Legs and antennæ pale brown; apex of latter black.

Length 2½ lines.

Weybridge, &c.

ACALYPTA.

I. Disk of thorax with only one keel .. .. *brunnea*.
II. Disk of thorax with three keels.
A. Lateral crests touching the hood in front *parvula*.
AA. Lateral crests abbreviated, not touching the hood.
B. Sides of thorax with three rows of meshes in front; elytra with two rows .. *cervina*.
BB. Sides of thorax with two rows of meshes in front; elytra with one row—
a. Sutural area with three rows of meshes *nigrina*.
b. Sutural area with two rows of meshes *macrophthalma*.

1. *brunnea*, Germ. = *concinna*, Dougl. & Scott. Fig. (*concinna*) Ent. Ann. 1863, fig. 5.

Ochreous, largely punctured. Head brown. Thorax

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with a single straight median crest; sides with three rows of meshes, the internal row very irregular. Elytra largely punctured; sides with two rows of meshes; dorsal carinæ much raised, united at a little less than three-quarters of the length of the elytra from their base; entire surface sprinkled with occasional round brown spots. Legs and antennæ ochreous; apex of latter brown.

Length 1 line.

Moss on oak trees; Scarborough and Darenth Wood.

2. *parvula*, Fall. = *obscura*, Dougl. & Scott. Fig. H.-Scff. Wanz. Ins. iv. fig. 372.

Smaller than the preceding; dark grey. Head nearly black. Thorax strongly punctured in front, finely meshed at the base; disk with three crests; the lateral ones produced to the front hood; sides of thorax with two rows of clear meshes in front, one behind. Elytra finely meshed, with one row of clear meshes at the sides, elongate and somewhat sinuate posteriorly; in developed specimens short, and rounded in undeveloped. Legs and antennæ testaceous; apex of latter black.

Developed form rare.

Length 1 line.

Not uncommon in moss, &c.

3. *cervina*, Germ. Fig. Dougl. & Scott, Brit. Hem. pl. ix. fig. 7.

Larger than either of the preceding species; testaceous. Head brown. Antennæ and legs reddish; apex of former black. Thorax with three keels, the side ones abbreviated; sides much expanded, angulated in front at their juncture with front margin, with 3—4 rows of meshes. Disk largely punctured, posteriorly meshed. Elytra meshed. Side margins very wide at the shoulders, with three rows of meshes; narrow in the middle, with one row; and wider again towards the apex, with two rows. Beneath testaceous-brown.

Length 1½ line.

Rare; in moss, &c.

4. *nigrina*, Fall.

A more convex species than any other of this genus. Dark iron grey. Head and antennæ black; third joint sometimes reddish. Sides of thorax with two rows of fine meshes. Disk with three keels, the side ones abbre-

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viated. Anterior angles rounded. Elytra finely and regularly meshed; sides with one row of meshes; sutural area with three rows.

Length 1 line.

Scotland.

5. *macrophthalma*, Fieb.

Only differs from the former in its paler colour, and in the sutural area having two rows of meshes only. I have, however, a specimen in which on one side a third row is set up; and I am therefore inclined to doubt the value of this species.

Length 1 line.

ARADIDÆ.

I. Scutellum semicircular .. .. *Aneurus.*
II. Scutellum triangular .. .. *Aradus.*

Aneurus.

1. *lævis*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. ix. fig. 8.

Exceedingly flat; deep brown, punctured. Head with a very projecting central lobe and a triangular projection on each side, between it and the eye. Antennæ with the terminal joint as long as second and third together. Thorax subtrapezoidal, slightly sinuate at its sides. Scutellum large, rounded. Corium exceedingly short. Membrane very large, finely reticulated; the abdomen projecting all round it.

Length 2½—3 lines.

Under bark; generally distributed.

Aradus.

A. Second joint of antennæ short and thick, much shorter than third and fourth together .. .. *depressus.*
AA. Second joint of antennæ more elongate, nearly as long as third and fourth together.
a. Species brown .. .. *corticalis.*
b. Species deep black.. .. .. .. *aterrimus.*

1. *depressus*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. ix. fig. 9.

Head, thorax, antennæ and scutellum brown; granu-

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lated. Thorax with four granulated keels on the disk; sides foliaceous, widely reflexed, with a clear white spot near the anterior angle. Scutellum granulated in front; transversely rugose posteriorly; its sides much reflexed. Elytra pale whitish, posteriorly brown. Sides much dilated at the base. Membrane brown, paler at the base. Nerves white. Connexivum red-brown. Legs pale.

Length 3 lines.

Under bark, &c.; not rare.

2. *corticalis*, Linn. Fig. Curtis, Brit. Ent. v. pl. 230.

Dull brown. Thorax with four granulated keels on the disk. Sides foliaceous, irregularly dentate in front; narrowly reflexed. Base deeply sinuate in the middle. Scutellum finely granulated, with its margins slightly raised. Elytra rather paler towards the base; slightly dilated at the shoulders. Connexivum brown, each segment with a paler spot at the apex. Antennæ with the apex of third joint pale.

Length 3 lines.

Rare; under bark of firs; West Wickham, Kent.

3. *aterrimus*, Dougl. & Scott.

Deep black. Thorax with four granular keels; lateral margins narrow, and but slightly reflexed posteriorly; base nearly straight. Scutellum with the sides much raised. Elytra slightly dilated at the shoulders, with strongly marked nerves. Connexivum with a yellowish spot at the posterior angle of each segment.

Length 2¾ lines.

Darenth Wood. One specimen, Douglas.

CAPSIDÆ.

I. Head channelled in the centre, or transversely impressed on the vertex.

A. First joint of tarsi much longer than second.

B. Head not channelled, vertex impressed .. *Acetropis.*

BB. Head channelled down the middle.

C. Head longer than broad.

a. Base of thorax truncate, covering the base of the scutellum. Scutellum punctured *Miris.*

b. Base of thorax emarginate, not covering the base of the scutellum. Scutellum smooth .. .. *Megalocerœa.*

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CC. Head much broader than long.
a. Elongate, depressed, smooth .. .. *Teratocoris.*
b. Elongate, not depressed, covered with long hairs .. .. *Leptopterna.*
AA. First joint of tarsi not longer than second .. *Pantilius.*

II. Head not channelled or transversely impressed.
A. Thorax with the anterior margin raised and rounded, or constricted into a short, collar-like neck, or much constricted in front and much raised and widened behind, with the posterior margin largely emarginate, the callosities often very prominent.
B. Thorax not much raised posteriorly, base not widely emarginate.
C. Membrane with two cells.
D. Sides of the thorax sharp in front .. .. *Lopus.*
DD. Sides of the thorax not sharp in front.
E. Neck more or less swollen, head not divided from the neck by a carina, or raised line.
F. Membrane marbled .. .. *Phytocoris.*
FF. Membrane not marbled.
G. Rostrum extending beyond the posterior coxæ.
a. Posterior tibiæ long; nearly twice as long as the intermediate ones .. .. *Miridius.*
b. Posterior tibiæ not so long; not more than once and a half as long as the posterior ones .. .. *Oncognathus.*
GG. Rostrum not extending beyond the posterior coxæ.
H. Species not deeply punctured, or rugose.
a. Second joint of antennæ not clavate .. *Calocoris.*
b. Second joint of antennæ thickly clavate.. *Rhopalotomus.*
HH. Species deeply punctured, or rugose.
a. Species glabrous .. .. *Capsus.*
b. Species hairy .. .. *Bothynotus.*
EE. Neck not swollen, head carinated posteriorly.
F. Carina visible only near the eye on each side.
a. Suboval, third and fourth joints of antennæ subequal .. .. *Liocoris.*
b. Subelongate, fourth joint much shorter than third .. .. *Dichrooscytus.*
FF. Carina visible throughout.
G. Species covered with golden, deciduous, scattered pubescence .. .. .. *Pœciloscytus.*
GG. Species not covered with golden pubescence.
H. Species more or less pubescent.
I. Vertex very wide .. .. *Hadrodema.*
II. Vertex not very wide.
a. Thorax transversely rugose .. .. *Plesiocoris.*
b. Thorax not transversely rugose .. .. *Lygus.*

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HH. Species glabrous .. .. *Camptobrochis.*
CC. Membrane with one cell.
a. Third and fourth joints of antennæ subequal .. .. *Bryocoris.*
b. Third joint distinctly longer than fourth *Monalocoris.*
BB. Thorax much raised posteriorly; posterior margin largely emarginate.
C. First joint of tarsi twice or three times longer than second .. .. *Pithanus.*
CC. First joint of tarsi not much longer than second.
D. Eyes touching or almost touching the anterior margin of the thorax.
E. Second joint of the antennæ longer than the third and fourth together.
a. Callosities of the thorax very prominent.. *Globiceps.*
b. Callosities of the thorax not prominent.. *Cyllocoris.*
EE. Second joint of antennæ not so long as the third and fourth together.
F. Antennæ somewhat robust, thorax with long scattered hairs .. .. *Eroticoris.*
FF. Antennæ very fine, thorax not hairy.
G. Thorax with an elongate collar .. .. *Campyloneura.*
GG. Thorax without an elongate collar.
H. Species nearly entirely green, elytra subdiaphanous .. .. *Ætorhinus.*
HH. Species not green, elytra not diaphanous.
a. Cells of wings without a hook-like nerve *Chlamydatus.*
b. Cells with a hook-like nerve .. .. *Byrsoptera.*
DD. Eyes situated at some distance from the front margin of the thorax.
E. Species not green, head constricted behind the eyes; eyes large.
a. Posterior thighs grooved .. .. *Systellonotus.*
b. Posterior thighs not grooved .. .. *Dicyphus.*
EE. Species green, head not constricted behind the eyes; eyes small .. .. *Macrolophus.*
AA. Thorax with the anterior margin not raised and rounded, nor constricted into a short collar-like neck, nor much constricted in front and widened behind, with the posterior margin emarginate.
B. Eyes not nearly touching the anterior margin of the thorax.. .. .. *Malacocoris.*
BB. Eyes touching or nearly touching the anterior margin.
C. Posterior tibiæ more or less curved and flattened .. .. *Pilophorus.*
CC. Posterior tibiæ not curved and flattened.
D. Wing cells without a hook-like nerve.
E. Vertex of head covering the front margin of the thorax or produced posteriorly and more or less rounded.

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E*. Short and stout, not covered with yellow or white scale-like pubescence.
a. Antennæ very long and thin, nearly twice as long as the body .. .. *Halticus.*
b. Antennæ not long and thin .. .. .. *Stiphrosoma.*
E*E*. More or less elongate, black, covered with short yellow or whitish scale-like hairs .. *Heterocordylus.*
EE. Head not covering the front margin of the thorax, nor produced posteriorly.
F. Second joint of antennæ not much dilated and flattened.
G. Insect covered with short deciduous golden or whitish hairs .. .. *Orthocephalus.*
GG. Insect not covered with short deciduous golden or whitish hairs.
a. Second joint of antennæ very long, once and a half as long as the third and fourth together .. .. .. *Loxops.*
b. Second joint of antennæ not nearly so long as the third and fourth together *Orthotylus.*
FF. Second joint of antennæ much dilated and flattened .. .. *Heterotoma.*
DD. Wing cells with a hook-like nerve.
E. Body dull and opaque.
F. Tibiæ spotted with black .. .. .. *Anotherops.*
FF. Tibiæ not spotted
G. Species more or less densely hairy; hairs chiefly black.
H. Eyes not very small, distance between the eyes not so wide as twice the width of the eye, lateral margin of thorax not sharp.
a. Antennæ subrobust throughout .. *Hoplomachus.*
b. Antennæ very thin at the apex .. *Macrocoleus.*
HH. Eyes very small, vertex much wider than twice the width of the eye, side margins of the thorax more or less sharp .. .. *Amblytylus.*
GG. Species without black hairs, pubescence very fine and regular.
a. Head across the eyes not nearly so wide as the base of the thorax .. .. *Oncotylus.*
b. Head across the eyes as wide or nearly as wide as the base of the thorax .. *Conostethus.*
EE. Body more or less shining.
F. Second joint of antennæ shorter than third .. *Harpocera.*
FF. Second joint of antennæ longer than third.
G. Elongate, depressed, elytra parallel-sided, tibiæ with pale spines .. .. .. *Phylus.*
GG. Not elongate, depressed and parallel-sided, tibiæ with black spines.
H. Elytra covered with a short, deciduous, scale-like, pale pubescence.
a. Second joint of antennæ much incrassated.. .. .. *Atractotomus.*
b. Second joint of antennæ not thickened *Psallus.*

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HH. Elytra without short, deciduous, scale-like hairs; pubescence generally grey and adpressed .. .. *Plagiognathus.*

Acetropis.

1. *Gimmerthalii*, Flor. = *seticulosa*, Dougl. & Scott. Fig. Dougl. & Scott, Brit. Hem. pl. x. fig. 5.

♂. Elongate, nearly parallel-sided. ♀. Elongate, subelliptic. Pale ochreous, sometimes slightly greenish, with scattered erect black hairs. Head with a central dark line, and a dark margin to the eyes. Thorax with the sides very thin and slightly reflexed; a narrow line bordering the pale dorsal line, and a wider one about midway between it and the lateral margin, brown. Scutellum with a brown line on each side of the disk. Elytra, within the discal nerve of the corium, slightly darkened; nerves very prominent in the ♀. Legs and antennæ the same colour as the upper surface in the ♂, rather darker in ♀.

Length 2¾ lines.

In damp places by sweeping. Woking, Deal, New Forest, &c.

Miris.

A. Hind thighs toothed beneath .. .. .. *calcaratus.*

AA. Hind thighs not toothed.

a. Insect elongate, face with a distinct impression extending to its apex .. .. *lævigatus.*

b. Insect subrobust, face impressed deeply only near the forehead .. .. .. *holsatus.*

1. *calcaratus*, Fall. Fig. (*dentata*) Hahn, Wanz. Ins. i. 15, fig. 8 (not good).

Ochreous or green. Antennæ and tarsi in green specimens more or less red. Thorax and scutellum deeply punctured, the former with a dark stripe down each side at some distance from the margin. Elytra, in some specimens, with a short brown line on the clavus and a narrow brown stripe down the corium; in others almost concolorous throughout. Legs, with the thighs, more or less spotted; hind thighs with two sharp teeth. Antennæ shortly pilose, apical joint and basal joint about equal in length, third and fourth together shorter than second.

Length 3½—4 lines.

Common by sweeping, &c.

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2. *lævigatus*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. x. fig. 4.

Ochreous or green. Antennæ and tarsi in green specimens red. Thorax and scutellum closely and deeply punctured; sides of former sinuate, with a brown stripe within the margin as in the preceding species. Elytra concolorous throughout, or nearly so. Thighs spotted, unarmed. Antennæ: first joint densely pilose, shorter than apical joint; third and fourth together longer than second.

Length 3½—4 lines.

Common by sweeping, &c.

3. *holsatus*, Fab. Fig. H.-Scff. Wanz. Ins. iii. fig. 256.

Shorter and broader than either of the preceding. Head and thorax more or less pale brown, with a darker stripe on each side. Thorax deeply punctured, its sides and base nearly straight. Elytra inwardly brown, outwardly pale green. Thighs spotted. Antennæ: first joint short and stout, covered with short brown hairs; third and fourth together considerably longer than second, fourth four-fifths as long as third. Beneath ochreous or green.

Length 3—3½ lines.

Not uncommon in grassy places, by sweeping.

Megaloceræa.

A. Third joint of antennæ much shorter than second .. .. *erratica.*

AA. Third joint of antennæ as long as the second.

1. Antennæ obscure, longer than body; basal joint long, three-quarters as long as the head and thorax together .. .. *longicornis.*

2. Antennæ red, about the same length as body, basal joint scarcely longer than head .. .. *ruficornis.*

1. *erratica*, Linn. Fig. Hahn, Wanz. Ins. ii. fig. 163, 164.

Pale green, with three stripes on the head and four on the thorax black; or black, with the sides of thorax and elytra yellowish-green; in the latter the dorsal line of the thorax and of the scutellum and the crown of the head are generally pale also. Tibiæ and antennæ densely pubescent, thighs more or less spotted, third joint of

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antennæ considerably shorter than second, fourth and first subequal.

Length 4 lines.

Common by sweeping, &c.

2. *longicornis*, Fall. Fig. H.-Scff. Wanz. Ins. iii. fig. 258.

Rather larger than the preceding, with much longer antennæ; pale-green, thorax more or less fuscous in the middle. Legs and antennæ shortly haired; tibiæ finely spined on their inner margins. Antennæ darkened towards the apex; second and third joints subequal, fourth joint shorter than the first.

Length 4 lines.

By sweeping; not abundant.

3. *ruficornis*, Fall.

Green, with the antennæ and tarsi more or less red. Much smaller than either of the preceding, with thicker antennæ. Thorax and scutellum often with a pale dorsal line, bordered on each side with a narrow brown one; there is also a brown stripe in some near the lateral margin. Antennæ with the second and third joints subequal, and the fourth rather shorter than the first.

Length 2½—3 lines.

Common by sweeping, especially in damp places.

Teratocoris.

A. Third joint of antennæ about four-fifths as long as second .. .. *antennatus.*

AA. Third joint of antennæ scarcely more than half so long as second.

a. Basal joint of antennæ in ♂ not so long as fourth. Thorax and scutellum in ♂ black, with light markings; ♀, first joint of antennæ once and a half as long as head; insect livid green .. .. *viridis.*

b. Basal joint of antennæ in ♂ as long as fourth. Thorax and scutellum pale, with black markings; ♀, first joint of antennæ once and two-thirds as long as head; insect bright green .. .. *Saundersi.*

1. *antennatus*, Boh., var. = *dorsalis*, Dougl. & Scott. Fig. Ent. Annual, 1866. Frontisp. fig. 4—4*.

Pale green, or greenish-yellow. Head black, with a pale spot on each side of the base. Thorax black, with

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the callosities and hind angles yellowish; scutellum black. Elytra with the apex of the clavus widely black, and with a broad black margin to the suture of the corium, the black colour often covering the apex, and also extending on to the disk just above the middle. Apex of femora and the tibiæ more or less red. Antennæ with the first joint reddish, narrowly black at the base; second joint red, third and fourth brown.

Length 2—3 lines.

Wicken Fen and Reigate; in marshy places.

2. *viridis*, Dougl. & Scott. Fig. Ent. Month. Mag. vol. iv. pl. i. fig. 2.

Pale green, ♂ with the head and thorax black; the former with a yellowish spot on each side at the base; the latter with a spot on each side of the disk, and the posterior angles green. Elytra green.

♀ with only a line down the centre of the head black. Antennæ in both sexes green, dusky towards the apex; basal joint shorter than the apical joint.

Length 2 lines.

3. *Saundersi*, Dougl. & Scott.

Bright green. ♂ with a black streak extending from the front of the head nearly or quite to the apex of the scutellum, and a small black line near the anterior angle of the thorax; hind femora and tarsi more or less reddish at the apex. Antennæ red; basal joint, except at the apex, green; basal and apical joints subequal.

♀ paler than male; in developed specimens the black line only visible on the head and thorax, not extending to the scutellum; in undeveloped form entirely green.

Length 3 lines.

Deal; on rushes, &c. in marshy places; near the sandhills.

LEPTOPTERNA.

A. Hairs of legs and antennæ long and projecting. Elytra with a wide lateral yellow stripe .. .. *dolobrata.*

AA. Hairs of legs and antennæ shorter, not so projecting. Elytra almost unicolorous, or with a very narrow lateral band .. .. .. *ferrugata.*

1. *dolobrata*, Linn.

♂ Head and thorax black, the former with a spot near each eye, and another, longitudinal one, above the mouth;

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the latter with the dorsal line and lateral margins yellow. Scutellum black; dorsal line yellow, the colour spreading suddenly near the middle. Elytra inwardly dull brown, margins widely yellow; legs pale, more or less spotted. Antennæ black; first joint more or less pale. Beneath yellow, variegated.

♀ wider, almost always with the elytra not fully developed, much paler than ♂; scutellum entirely pale, the yellow also predominating on the thorax.

Length 4 lines.

Common by sweeping.

2. *ferrugata*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. x. fig. 6.

Narrower than the preceding, and much duller n colour. Head black, with a narrow stripe on the inner margin of each eye. Thorax black, with the dorsal line and side margins pale. Scutellum black, with the dorsal line pale. Elytra dull, pinkish-brown, with the margin narrowly ochreous. Legs more or less spotted. Antennæ black, second joint brown. ♀ generally undeveloped.

This species varies much in colour.

Length 4 lines.

Common, by sweeping, &c.

Pantilius.

1. *tunicatus*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. xi. fig. 2.

Greenish-red to reddish-brown, sprinkled with very small black spots, from each of which is a short thick black hair. Thorax with a narrow collar in front, lateral margins with sharp edges, nearly straight. Elytra with the margins narrowly pale. Cuneus often of a blood-red colour on its inner margin; membrane with the nerves red. Antennæ and legs pale, more or less tinged with red. Apex of 2nd, 3rd and 4th joints of the former red, or red brown; second joint three times as long as first; third joint ¼ as long as second; fourth ½ as long as third.

Length 4 lines.

On hazels, not uncommon in August and September.

Lopus.

A. Legs and antennæ densely covered with long black hairs .. .. *gothicus*.

AA. Legs and antennæ without long black hairs, or only with occasional ones.

a. Thighs with a red ring .. .. .. *mat*.

b. Thighs without a red ring .. .. *sulcatus*.

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1. *gothicus*, Linn. Fig. Panz. Faun. Germ. 92, 15.

Black, covered with erect black hairs; head with a small yellow spot near each eye; sides of the thorax in front yellow; scutellum with the apex red; elytra with the exterior margin of the corium, except at its extreme apex, yellow; cuneus red, with the apex and the inner margin black. Legs and antennæ black.

Var. *superciliosus*. Entirely black, except the pale sides to the corium.

Length 3—3½ lines.

2. *mat*, Ross. Fig. (*miles*) Dougl. & Scott, Brit. Hem. pl. xv. fig. 7.

Very similar to the preceding in colour, but at once distinguished by the absence of the erect black hairs on the surface, in place of which is a fine yellow adpressed pubescence; the red colour on the sides of the thorax is generally wider, and the dorsal line is also in most specimens red. Thighs each with a red ring; tibiæ also often pale in the middle.

Length 3—3½ lines.

3. *sulcatus*, Fieb.

Like the two preceding species in colour, except that the markings are paler; but at once distinguishable by its longer form, the narrower thorax in front, with sinuate sides, and the sulcate scutellum.

Length 3—3½ lines.

Portsmouth and Slapton.

Phytocoris.

I. Species black or grey.
- A. Lateral margins of corium dark throughout, without marbling or spots .. .. .. *distinctus*.

AA. Lateral margins marbled or spotted.
- B. Dark bands of the intermediate tibiæ very distinct; much narrower than the intervening pale bands; basal band not wider than the others.
  - a. Elytra very long, dull grey, very indistinctly mottled .. .. *longipennis*.
  - b. Elytra shorter, black and green, or black and yellow; marbling distinct .. .. *tiliæ*.
- BB. Dark bands of the intermediate tibiæ not very distinct, nearly as wide or wider than the pale bands; basal band generally wider than the rest.
- C. Basal joint of the antennæ longer than the thorax.
  - a. Larger; second and third joints of antennæ, exceedingly narrowly pale at the base .. *populi*.

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b. Smaller; second and third joints of antennæ, rather widely pale at the base .. *Reuteri*.

CC. Basal joint of antennæ not so long as thorax *pini*.

II. Species red-brown.

a. Basal joint of antennæ not thickened, and set with strong bristly black hairs; scutellum without a pale central line .. *ulmi*.

b. Basal joint of antennæ thickened, and not set with strong bristly black hairs; scutellum with a pale central line .. *varipes*.

1. *distinctus*, Dougl. & Scott.

Head and thorax brownish-grey, the latter more or less clouded with black posteriorly; the basal margin white. Scutellum black-brown, with a spot on each side, and the apex white. Clavus and corium uniformly black or black-brown, with the exception of a square spot above the cuneus, clothed with intermixed black and pale-grey hairs. Cuneus paler, with the margins more or less darkened; membrane marbled. Femora mottled, especially near the apex. Tibiæ barred with black.

Length 3½—4 lines.

On poplars; Blackheath, &c.

Easily distinguished by the unicolorous corium from all the other species.

2. *longipennis*, Flor.

= *dimidiatus*, Dougl. & Scott.

Greyish-brown, indistinctly mottled with lighter colour. Legs with thighs mottled, especially near the apex; tibiæ barred with black. This and the following species (var. *dubius*, Dougl. & Scott) are sometimes very much alike in colouring, but this may be distinguished by the longer, thinner antennæ, longer elytra, which are more indistinctly mottled, and by the distinct narrow black rings on the intermediate tibiæ; it is, also, altogether a more graceful looking insect.

Length 3½—4 lines.

On oaks, &c.; not rare.

3. *populi*, Linn.

Var. = *dubius*, Dougl. & Scott.

Sometimes nearly black, mottled with brown, or greyish-brown mottled with lighter colour; very variable. In the darker varieties the first joint of the antennæ is generally longitudinally streaked with black; in the paler varieties it is mottled. I cannot, however, imagine that such a character alone should be of specific value.

Length 3½ lines.

On poplar, lime, oak, &c.

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4. *tiliæ*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. x. fig. 8.
Var. = *marmoratus*, Dougl. & Scott.

Pale green or yellow, more or less mottled, and marked with black and brown; sides of the thorax and base sometimes widely black. Thighs mottled; tibiæ barred with black.

Length 3½ lines.

On oaks, &c.

A very pretty and variable species, the elytra sometimes (in var. *marmoratus*) being nearly black speckled with yellow, and with a larger yellow spot on the lateral margin, besides the cuneus and the spot on the corium adjoining it. At other times the elytra are green, with only occasional darker markings. Between these extreme varieties all sorts of intermediate colourings may be found. The bright clear markings distinguish this species from all its allies.

5. *Reuteri*, Saund.
= *crassipes*? Dougl. & Scott, nec Flor.

Grey-brown, indistinctly mottled with lighter brown; corium inwardly darker; legs barred much as in *populi*, from which it is easily distinguished by its shorter, smaller form and less marbled elytra.

Length 3¼ lines.

On apple trees, &c.

6. *pini*, Kirsch.

Colour and marbling almost exactly like the preceding, but at once distinguishable by the short first joint of the antennæ and the much shorter posterior tibiæ.

Length 3¼ lines.

On firs; Scotland.

7. *varipes*, Boh. Fig. (*ulmi*) H.-Scff. Wanz. Ins. iii. fig. 234.
= *ulmi*, Dougl. & Scott, &c., nec Linn.

Brownish-red or ochreous-brown; elytra with irregular longitudinal darker markings; lateral margins narrowly mottled. Cuneus marbled with purplish-red; membrane marbled with grey. Femora brown, with lighter markings; front tibiæ with two rings, and the apex, brown; intermediate tibiæ with a very narrow ring near the base, sometimes scarcely visible; posterior tibiæ with the base widely brown. Antennæ: first joint marbled, and with long

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projecting concolorous hairs; rest brown, with the base of second pale.

Length 3½ lines.

Common by sweeping, &c., in summer.

8. *ulmi*, Linn. Fig. (*divergens*) Mey. Caps. pl. i. fig. 1.

= *divergens*, Dougl. & Scott, &c.

Similar to the preceding in colour, but with the elytra finely mottled, more densely pubescent, and without the dark lines. Cuneus generally blood-red, except at the base. The antennæ are longer, and the basal joint thinner, and set with scattered, strong, black, bristly hairs; legs as in the preceding, but the rings on the front legs scarcely visible.

Length 3¼—3½ lines.

By beating and sweeping; not uncommon.

Miridius.

1. *quadrivirgatus*, Costa. Fig. Dougl. & Scott, Brit. Hem. pl. x. fig. 7.

Pale yellowish-white, finely pubescent. Head, thorax and scutellum with two longitudinal brown stripes, extending from the mouth to the apex of the scutellum; sides of the thorax also brown. Elytra: clavus outwardly widely brown, nerves pale; corium brown between the nerves; cuneus red-brown in the middle, its margin pale; membrane darkened round the nerves, and also with a darker stripe below the cell. Legs and antennæ pale, finely spotted with red-brown.

Length 4½ lines.

By sweeping; Deal, Lowestoft, Worthing; rare.

Oncognathus.

1. *binotatus*. Fab. Fig. H.-Scff. Wanz. Ins. iii. fig. 296.

Green or yellowish-green, clothed with black hairs, intermixed with scattered deciduous golden ones. Thorax generally with two small round black spots on the disk. Corium often with two longitudinal stripes, posteriorly more or less black. Membrane dusky; nerves and a wide margin on each side of them paler. Legs with the the thighs spotted.

Length 4 lines.

Very common, by sweeping, &c.

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Calocoris, Fieb.

I. Apex of cuneus more or less widely black.
  A. Scutellum dark.
    a. Corium unicolorous throughout .. .. *fulvomaculatus.*
    b. Corium widely pale, exteriorly at the shoulders .. .. *seticornis.*
  AA. Scutellum pale, except at the base.
    a. Elytra pale yellow, with longitudinal dark striæ .. .. *striatellus.*
    b. Elytra black, with pale yellow spots .. *sexguttatus.*

II. Apex of cuneus not black, or only so at the very extreme apex.
  A. Species not green, nor greyish-green.
  B. Surface dull, more or less pubescent.
  C. Thorax black, with pale markings.
    a. Basal joint of antennæ longer than head *striatus.*
    b. Basal joint of antennæ robust, not so long as head .. .. *marginellus.*
  CC. Thorax not black.
    a. Apical joint of antennæ not nearly so long as the third .. .. .. *ticinensis.*
    b. Apical joint of antennæ almost as long as third .. .. *roscomaculatus.*
  BB. Surface glabrous, shining .. .. .. *infusus.*
  AA. Species green or greyish-green.
  B. Third and fourth joints of antennæ as thick as the rest .. .. *chenopodii.*
  BB. Third and fourth joints of antennæ thinner than the rest.
    a. Apical joint longer than third .. .. *alpestris.*
    b. Apical joint not so long as third .. *bipunctatus.*

1. *fulvomaculatus*, De Geer. Fig. Dougl. & Scott, Brit. Hem. pl. xi. fig. 1.

Dull greyish-brown, clothed with a pale, golden, scale-like pubescence. Head generally with a pale spot near each eye. Thorax dark, with a pale spot on the dorsal line; or pale, with the anterior portion and a spot on each side of the base dark. Elytra of the same colour as the thorax. Cuneus orange-coloured, with the apex widely black. Legs and antennæ reddish-brown; femora irregularly spotted with darker brown; second joint of antennæ darker at the apex.

Length 3 lines.

On various shrubs and bushes; often very abundantly.

2. *seticornis*, Fab. Fig. Hahn, Wanz. Ins. i. fig. 114 (*lateralis*).

Head and thorax black, shining; the latter often with a red spot on the disk. Elytra dark brownish-black,

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clothed with a pale golden deciduous pubescence. Corium with a triangular spot, on its exterior margin, at the base, pale ochreous. Cuneus red, with the apex and the interior basal angle black, or occasionally entirely black. Membrane dark fuscous. Femora black, extreme apices paler; tibiæ of two anterior pairs pale. Antennæ: first and second joints dark, third and fourth paler.

Length 3½—4 lines.

Very rare; Isle of Wight.

3. *striatellus*, Fab. Fig. Hahn, Wanz. Ins. ii. fig. 218.
= var. *fornicatus*, Dougl. & Scott.

Pale yellow. Head variegated with brown and black. Thorax shining, with the base more or less widely, except the actual margin, and two spots on each side of the disk, black. Scutellum pale black at the base. Elytra covered with fine adpressed hairs. Clavus and corium longitudinally streaked with black. Cuneus with the apex widely black. Membrane dusky; nerves, and a spot on each side below the apex of the cuneus, pale. Thighs reddish, with a paler band near the middle; tibiæ paler, their apices and tarsi brown. Antennæ with the apex of second and the whole of the third and fourth joints brown.

Length 3¾—4 lines.

Common, by beating trees, &c.

4. *sexguttatus*, Fab. Fig. H.-Scff. Wanz. Ins. iii. fig. 295.

Head black, with a pale spot near each eye above the insertion of the antennæ. Thorax black, with the collar, dorsal line, and an elongate marginal spot on each side, pale yellow. Scutellum black at the base, pale at the apex. Clavus pale at the apex. Corium black, lateral margin, and an elongate humeral spot, and a small spot at the interior angle above the membrane, pale yellow. Cuneus orange-coloured, apex black; membrane dusky, with a spot at the apex of the cuneus paler. Legs dark greyish-brown; thighs sometimes spotted. Antennæ black.

Length 3¼ lines.

Not common, by beating and sweeping.

5. *striatus*, Linn. Fig. Panz. Faun. Germ. 93, 22.

Head and thorax black; the former with the inner margins of the eyes more or less yellow, the latter with a yellow spot on the disk; the size of this spot varies much, and sometimes spreads all over the thorax. Scutellum

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yellow, with the base and a central line black. Elytra of a lurid yellow, the nerves margined with black; cuneus orange-coloured. Membrane dusky, with a transparent spot below the apex of the cuneus. Legs red; tarsi and the base of the posterior tibiæ black. Antennæ: first joint generally red, rest black; base of third yellow.

Length 5—5½ lines.

Occasionally by beating trees, &c.

6. *marginellus*, Fab. Fig. Hahn, Wanz. Ins. ii. fig. 202 (*scriptus*).

Head and thorax black, the latter with the collar, dorsal line at the base and a short line on each side near the posterior angle, yellow. Scutellum black. Elytra with the clavus exteriorly yellow. Corium widely yellow or orange-coloured on the lateral margins; brown or black on the disk, often with a yellow stripe within the discal nerve. Cuneus orange-coloured. Membrane dusky. Legs dusky-brown. Antennæ black.

Length 4 lines.

Very rare. To be looked for by sweeping and beating.

7. *ticinensis*, Mey. Fig. Meyer, Caps. T. vi. fig. 1.

Dull red, the cuneus sometimes paler. Head and the tubercles in front of the thorax sometimes more or less brown. Thighs spotted with brown, or in some very dark specimens the hind thighs are almost black. Surface of head and thorax shining; elytra dull, clothed with rather long yellow hairs.

Length 3½—4 lines.

By sweeping in marshes near Gomshall and Chobham, Surrey.

8. *roseomaculatus*, De Geer. Fig. Hahn, Wanz. Ins. i. fig. 104 (*ferrugatus*).

Head black, with a yellow line round the eye; or more or less red, with paler markings. Thorax pale green or greenish-yellow, with a wide brown stripe on each side of the disk, and often with the tubercles in front dark-brown or black. Scutellum pale, with the dorsal line and base widely black in the ♂, but with only a faint dark line down the centre in the ♀. Elytra: clavus red, with the apex green; corium green or greenish-yellow, with two elongate red spots placed side by side above the cuneus, red; these are sometimes confluent. Cuneus pale. Legs in ♂ dull reddish, spotted with brown on the thighs; in ♀ greenish,

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spotted on thighs with red. Antennæ brown or red, with the basal joint in the ♂ often black.

Length 3½ lines.

Very common by sweeping, &c.

9. *infusus*, H.-Scff. Fig. H.-Scff. Wanz. Ins. iv. fig. 381.

Yellow or orange-yellow; glabrous, very variable in colour; sometimes almost unicolorous; at others, with the posterior margin of the thorax, the scutellum, and a wide band across the apex of the corium, black; legs and antennæ red; between these extreme colourations there is nearly every gradation, the posterior band often appearing only as a spot in the centre of the apical margin of the corium.

Length 3½ lines.

Not common; on oaks; Lewisham, Chobham, and Gomshall, Surrey.

10. *chenopodii*, Fall. Fig. Faun. Germ. 93, 21.

Dull green or greyish-green, often with two small round spots on the posterior portion of the thorax; a wide central line on the scutellum, the clavus and a large triangular spot on the corium, widest posteriorly, brown; internal angle of cuneus also of the same colour. Head and thorax shining, punctured. Elytra dull, covered with fine golden hairs. Legs more or less brown. Thighs spotted. Antennæ brown.

Length 4 lines.

Common on *Ononis*, &c., in summer.

Easily distinguished from our other green species by the thick third and fourth joints of the antennæ.

11. *alpestris*, Mey. Fig. Ent. Month. Mag. vol. iv. pl. i. fig. 3.

Elongate green, clothed with fine black hairs. Tarsi and antennæ, except the basal joint, brown. Head, front of thorax and scutellum paler.

Length 5 lines.

Burton-on-Trent and Gibside.

Longer and narrower than its allies, and distinguishable by the long apical joint to the antennæ.

12. *bipunctatus*, Fab.

Green or brownish-green, clothed with short black hairs, and with occasional paler ones; thorax finely

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punctured and wrinkled, with two small round black spots in front. Elytra sometimes with one or two obscure brownish longitudinal lines near the apex; cuneus pale; membrane black, the nerves pale; antennæ green, darker towards the apex.

Length 3½ lines.

Very common by sweeping, &c.

Rhopalotomus.

1. *ater*, Linn. Fig. Doug. & Scott, Brit. Hem. pl. xiv. fig. 7.

Entirely black, or black with red legs, or with the thorax, and head at the base, also red. Thorax punctured, and transversely rugose posteriorly. Elytra covered with very fine depressed greyish hairs. Membrane dusky black. Antennæ: second joint club-shaped, densely pubescent.

Length 3 lines.

Common by sweeping, &c. among nettles.

Capsus.

1. Cuneus red, with apex black.. .. .. *laniarius.*
2. Entire insect black, with the scutellum sometimes red .. *scutellaris.*

1. *laniarius*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. xiv. fig. 8.

= *capillaris*, Dougl. & Scott, &c.

Black or reddish-ochreous, deeply punctured; the cuneus, with the exception of the black apex and interior basal angle, always red; in the black variety the corium is sometimes pale at the base, and the thorax round its margins. Legs with the thighs black at the base, reddish at the apex; tibiæ red, hind pair with a dark-brown line exteriorly near the base. Antennæ black, third and fourth joints paler, and sometimes the middle of second.

Length 3—4 lines.

Common by sweeping in summer.

2. *scutellaris*, Fab.

Entirely black, or with the scutellum bright red, very deeply and somewhat rugosely punctured. Scutellum shining and impunctate.

Length 2¾ lines.

Very rare; by beating and sweeping. Dartford, Rei-

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gate, East Dereham and Woolmer Forest. July and August.

Smaller than preceding, more rugosely punctured, and with the scutellum impunctate and more shining.

Bothynotus.

1. *pilosus*, Boh. Fig. Ent. Ann. 1866. Frontisp. fig. 3.

♂ black-brown, covered with long brownish-grey hairs. Elytra punctured, brown, subtransparent, with the cuneus darker. Thorax very deeply and coarsely punctured. Legs pale brown.

♀ generally apterous, black. Thorax and elytra rugosely punctured. Head, legs, and first and second joints of antennæ, except the apex of the latter, red. Head generally with two brown frontal spots.

Length ♂ 3 lines; ♀ 2¼ lines.

Very rare; on the hills between Loch Long and Loch Lomond. July, 1865.

Liocoris.

1. 3-*pustulatus*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. xv. fig. 4.

Black or luteous, shining, glabrous; in the black var. with the head, except just above the mouth, a dorsal line to the thorax widening in front, the scutellum, a very small spot behind each shoulder, a wide band near the middle of the corium, a very small spot on each just above the angle of the membrane and the cuneus, except at the base and apex, flavous or reddish-yellow. Membrane dusky, with a clear spot below the apex of the cuneus. Legs pale, two rings on each thigh; the base and apex of each tibia, and a ring below the base, as well as the apex of tarsi, black. Antennæ black; base of the first joint, middle of second, and the third and fourth, brownish.

In the pale variety, a spot in the front of the head, a spot at each posterior angle of thorax, a wide band behind the middle of the corium, the base and apex of cuneus, and the markings on the legs, as in the dark form, are alone black. Beneath black, with the sides widely pale. Antennæ with the apex of second joint narrowly black.

This very pretty species varies so much that it is useless to attempt to give all its varieties; two of the more usual ones are above given.

Length 2½ lines.

Very common by sweeping amongst nettles, &c.

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Dichrooscytus, Fieb.

1. *rufipennis*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. xv. fig. 8.

Head and thorax green. Scutellum more or less orange-coloured. Elytra blood red, with the lateral margins narrowly green. Membrane slightly dusky, nerves red. Beneath: legs and antennæ green, the latter reddish towards the apex.

Length 3—3¼ lines.

On fir trees; not rare.

Pœciloscytus.

I. Corium unicolorous, without flavous markings.
   a. Insect depressed, corium covered with golden hairs all over .. .. *nigritus.*
   b. Insect very convex, corium variegated with golden hairs in patches .. .. *Gyllenhalii.*
II. Corium with bright flavous markings .. .. .. *unifasciatus.*

1. *nigritus*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. xiv. fig. 9.

Black, clothed with adpressed, bright golden pubescence. Cuneus pale, a spot on its exterior margin near the apex black; membrane black, the nerves flavous. Legs black. Tibiæ with pale bars.

Length 2½ lines.

By sweeping on *Stachys*, &c.; Mickleham and elsewhere.

2. *Gyllenhalii*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. xv. fig. 1.

Short, oval, convex. Black, variegated with small spots of golden pubescence. Posterior margin of thorax very narrowly, apex of scutellum, margins of the elytra, and the entire cuneus, reddish. Legs: femora brown, with the base and a ring near the apex pale; tibiæ brown, paler at the apex; apical joint of the tarsi black. Antennæ yellowish-red; base of first joint, apex of second, third and fourth, brown.

Length 1½ line.

Common by sweeping, especially on *Galium*.

3. *unifasciatus*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. xv. fig. 6.

Black, covered with short golden deciduous pubescence;

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a spot on the head near each eye, the extreme basal margin of the thorax, the apex of the scutellum and the corium, with the exception of an irregular patch above the apex, flavous. Cuneus flavous, with a red patch inwardly and a black patch outwardly, the black patch extending a certain distance across the red; extreme basal inner angle black. Membrane dusky brown; nerves pale. Legs: femora brown; tibiæ paler; extreme apices black. Antennæ brown; third and fourth joints and apex of second darker.

Length 3—3½ lines.

Not uncommon by sweeping, and widely distributed.

Hadrodema.

1. *pinastri*, Fall. Fig. Hahn, Wanz. Ins. ii. fig. 173.

Testaceous, finely pubescent, deeply punctured; callosities of thorax brown or black; membrane dusky; femora with two narrow bands, or a few spots, red-brown; tibiæ with occasional red-brown spots.

Length 2½ lines.

On fir trees. Reigate, Weybridge, &c.

Varies much in colour—sometimes being nearly black.

Plesiocoris.

1. *rugicollis*, Fall. Fig. H.-Scff. Wanz. Ins. iii. fig. 299.

Yellowish-green, thorax posteriorly and the elytra brighter green; margins of the latter paler; disk of the former transversely rugose. Membrane transparent; nerves green. Antennæ near the apex and tarsi black.

Length 2¾ lines.

On willows. Coast of Lancashire and Deal.

Not very unlike *Lygus pabulinus*, but flatter, with much shorter antennæ and transversely rugose thorax.

Lygus.

I. Species green; thorax not coarsely and deeply punctured.

A. Hind thighs very elongate; spines of tibiæ pale and scarcely apparent .. .. *pabulinus*.

AA. Hind thighs not very elongate; spines of tibiæ black.

B. Elytra with a black transverse spot above the membrane .. .. *contaminatus*.

BB. Elytra without a black spot above the membrane.

a. Extreme apex of cuneus not black.. *lucorum*.

b. Extreme apex of cuneus black .. *Spinolæ*.

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II. Species not green; thorax in some species coarsely and deeply punctured.
  A. Species not orange red.
    B. Species large and robust .. .. .. *pratensis.*
  BB. Species small.
    C. Legs flavous; hind femora without brown rings, sometimes spotted .. .. .. *pastinacæ.*
  CC. Legs brownish or ochreous; hind femora with two brown rings.
    a. Basal ring broader than apical; second joint of antennæ not longer than third and fourth together .. *Kalmii.*
    b. Basal ring not broader than apical; second joint of antennæ longer than third and fourth together .. *cervinus.*
  AA. Species orange-red .. .. *rubricatus.*

1. *pabulinus*, Linn.

Bright green, clothed with fine pale hairs; apex of the second joint and the whole of the third and fourth joints of the antennæ brown. Thorax shallowly punctured.

Length 2¾—3 lines.

Common by sweeping nettles, &c.; easily distinguished from our other British species by its elongate form, unspotted elytra, and the fine pale spines on the tibiæ.

2. *contaminatus*, Fall.

Bright green, clothed with very fine pale hairs; a transverse spot on the corium above the membrane, the last two joints of the antennæ, the apex of the second, and the apex of the tarsi, brown. Membrane slightly dusky, with a darker spot at the apex of each cell, and a third below the apex of the cuneus.

Length 3 lines.

On birches, by sweeping, &c.

3. *lucorum*, Mey. Fig. Meyer, Caps. vi. fig. 2.

Bright green, third and fourth joints of the antennæ brown. Elytra often with a brownish mark just above the membrane. Membrane with a spot within the cell, a small spot below the apex of the cuneus, and another spot below it on the margin, darker.

Length 2½ lines.

Not common by sweeping.

4. *Spinolæ*, Mey. Fig. Meyer, Caps. i. fig. 2.

Closely allied to the preceding, but differing in being rather large, having the apex of cuneus black, the mem-

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brane less spotted and the posterior femora with two distinct apical rings.

Length 2½ lines.

Commoner than the preceding by sweeping, &c.

5. *pratensis*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. xv. fig. 2.

Ochreous or ochreous-grey, with brown markings, exceedingly variable; thorax strongly punctured; elytra covered with fine grey pubescence. Scutellum transversely rugose, posterior femora with two dark rings near the apex; sometimes united into one broad black ring.

Var. *campestris*.

Of a greenish tint, scutellum more swollen and less rugose.

Length 3 lines.

Very common everywhere by sweeping, &c.

6. *pastinacæ*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. xv. fig. 5.

Short, oval, punctured and covered with a fine ochreous pubescence. Pale yellowish-green. Clavus, a spot on the interior angle of each corium, above the membrane, the extreme apex of the cuneus sometimes, the last two joints of the antennæ and the apex and base of the second, black. Legs pale, apex of the tarsi black.

Length 2 lines.

Common by sweeping, &c.

Varies much in the ground colour, also in the size of the spots, which are sometimes scarcely visible.

7. *Kalmii*, Linn. Fig. Hahn, Wanz. Ins. i. fig. 109.

Oval, punctured, clothed with a fine greyish pubescence. Head ochreous, with an irregular brown spot in the middle. Thorax brown, with a pale dorsal line not reaching the anterior margin, and also with the thickened anterior margin itself, pale. Scutellum flavous, generally with a dark spot on the base. Elytra with the clavus, a broad band across the apex of the corium, and the apex of the cuneus, brown. Legs ochreous, middle pair of thighs with one brown ring; hind thighs with two brown rings near the apex. Apex of each tibia also brown. Antennæ brown.

Length 2—2½ lines.

Common on nettles, &c., by sweeping.

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Varies much in colour. Thorax often pale, with only two spots, near the anterior tubercles, black. The band on the corium is often so indefinite as to be hardly discernible.

8. *cervinus*, H.-Scff. Fig. Wanz. Ins. fig. 617 (not good).
Ochreous or ochreous-brown, punctured and covered with fine ochreous hairs. Scutellum dark, with a spot on each side of the base, and the dorsal line posteriorly, pale. Elytra with a more or less distinct red-brown or brown band above the membrane, sometimes almost obliterated, being marked only by one or two brown spots above the interior angle of the cuneus. Apex of cuneus black. Legs pale, posterior femora with two narrow red or brown rings. Antennæ with the third and fourth joints, and apex of second, brown or black.
Length 2½ lines.
Common on limes, by beating.

9. *rubricatus*, Fall. Fig. Hahn, Wanz. Ins. i. fig. 80.
Elongate, oval. Orange-red, finely punctured, and clothed with fine greyish-ochreous hairs. Apex of cuneus rather darkened; membrane dusky, with darker markings. Antennæ with third and fourth joints dusky.
Length 2½—3 lines.
Not uncommon on firs, &c.

Camptobrochis.

1. *lutescens*, Schill. Fig. Dougl. & Scott, Brit. Hem. pl. xv. fig. 9.
= *punctulatus*, Fieb., Dougl. & Scott.
Short, oval, luteous-brown, very shining, glabrous and strongly punctured. Head, median line of scutellum and its lateral angles, sides of the elytra at the base, and the base and extreme apex of the cuneus, lighter; the clavus also is sometimes pale. Membrane clear and transparent, with very short rounded cells, dark within them. Legs pale; hind femora with a dark ring near the apex; tibiæ with one or two darker rings. Antennæ pale; third and fourth joints, and apex of second, brown.
Length 1½—2 lines.
Not uncommon by beating maples, &c.

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Monalocoris.

1. *filicis*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. x. fig. 2.

Finely pubescent, piceous or testaceous-brown. Head, anterior margin of thorax, legs and antennæ testaceous; apex of tarsi, third and fourth and apex of second joints of antennæ, black. Beneath black or pitchy-black; membrane slightly dusky.

Length 1—1½ line.

On brake (*Pteris*) and other ferns; common by sweeping.

Bryocoris.

1. *pteridis*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. x. fig. 1 and 1*.

Developed form.—Head, thorax, scutellum and clavus black. Corium pale, semitransparent, with a slightly darker band above the cuneus; membrane dusky, with lighter markings.

Length 1½—2 lines.

Undeveloped form.—Pale ochreous, with the exception of a brown spot on the middle of the head and the callosities of the thorax. Thorax in ♂ sometimes piceous. Apex of the tarsi, the third and fourth joints of antennæ, and apex of second, black. Surface very shortly pubescent. Thorax rugosely punctured.

Length 1—1⅓ line.

On brake and other ferns.

The developed form is very rare, and in shape somewhat like an *Anthocoris*. The undeveloped form is common and something like the former species, but has no membrane.

Pithanus.

1. *Märkeli*, H.-Scff. Fig. Dougl. & Scott, Brit. Hem. pl. x. fig. 3.

Elongate, black; sides of the elytra and body and apical half of the basal joint of antennæ, flavous; legs red. Undeveloped form with only rudimentary wing cases.

Length 2—2⅓ lines.

Very common by sweeping, &c. in the undeveloped form; developed form exceedingly scarce.

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Globiceps.

I. Elytra black, with four pale spots.
  A. Apical joint of the antennæ more than half the length of the third; upper surface not pilose.
    a. Larger, the pale spot at the base of the corium extending along the lateral margin to below the middle .. .. .. *flavomaculatus.*
    b. Smaller, the pale basal spot truncate posteriorly, not extending along the lateral margin .. .. *fulvipes.*
  AA. Apical joint of antennæ not more than a quarter so long as the third; upper surface pilose *4-notatus.*
II. Elytra without four pale spots.
    a. Elytra pale whitish .. .. *dispar.*
    b. Elytra black, with the claval suture, and a short streak near the base, white .. .. *ater.*

1. *flavomaculatus*, Fab.
  = *selectus*, Fieb., Dougl. & Scott, &c.

♂ Elongate, black. Elytra each with a spot just below the base, and the cuneus (except the apex) ochreous; membrane blackish. Legs brownish-red. Antennæ black; basal joint red, third and fourth joints brown.

♀ Head very globose and shining. Elytra without membrane; apex of the cuneus rounded; second joint of the antennæ thickened considerably at the apex.

Length $2\frac{3}{4}$ lines.

Not uncommon by sweeping, &c.

2. *fulvipes*, Scop.
  = *flavomaculatus*, Fieb., Dougl. & Scott, &c.

Extremely like the preceding but smaller, and with the basal pale spot of the elytra truncate posteriorly, and not produced along the lateral margin. A very doubtful species.

Length $2\frac{1}{2}$ lines.

Rare, by sweeping.

3. *flavonotatus*, Boh. Fig. Dougl. & Scott, Brit. Hem. pl. xii. fig. 1.

Wider than the preceding; black, pilose; back of the head with a pale carina; a triangular spot at the base of each corium, the extreme lateral margin and the cuneus, with the exception of a black band just above its apex, also flavous. Membrane blackish, with a white spot on each side below the apex of the cuneus. Legs orange-red,

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generally with a brownish spot on each thigh. Antennæ black, basal joint and two apical joints reddish-yellow.

Length 2¾ lines.

Common on oaks.

4. *dispar*, Boh. Fig. Ent. Month. Mag. vol. iv. pl. i. fig. 4, ♂ and ♀.

♂ Head, thorax and scutellum black; elytra whitish, with a broad brownish cloud across the apex; cuneus with the apex brown, membrane dusky; legs brownish-yellow. Antennæ black, first joint at the base yellowish, third and fourth brownish-yellow.

♀ Elytra undeveloped, without cuneus or membrane, white and semi-transparent. Second joint of antennæ much thickened at the apex.

Length 1½ line.

Leicester; at the roots of grass in damp places.

5. *ater*, Dougl. & Scott.

Black. Antennæ with the basal half of the third joint yellow. Elytra: corium pitchy-black at the base, within the anterior margin a short whitish streak; claval suture very narrowly whitish, posterior margin black, cuneus black, base next the inner angle with a pale brownish-white patch; membrane pale brown; legs brownish-yellow.

Length 1¾ line.

A single ♀ taken at Leicester.

I do not know this species, and therefore give extracts from Messrs. Douglas and Scott's description.

Cyllocoris.

1. *histrionicus*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. xii. fig. 3.

Elongate. Head black, a spot on the neck pale. Thorax black, with the base and apex flavous; or orange-yellow, with a black spot on each side in front, not quite joining each other in the middle, and not touching the anterior margin; sides and base deeply sinuate. Scutellum black at the base, flavous at the apex. Elytra orange-yellow, corium widely pale along the claval suture, base of cuneus pale; legs orange-coloured, bases of the thighs paler. Antennæ: first joint pale, rest black. Undersides of head, thorax and breast black. Abdomen pale, with the base and a band near the apex brown.

Length 3½ lines.

On oaks, by beating in summer; common.

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Eroticoris.

1. *rufescens,* Burm. Fig. Dougl. & Scott, Brit. Hem. pl. xiv. fig. 6.

Subelongate, widened posteriorly, brownish-red; head rather darker than the thorax. Elytra with a triangular patch at the base of the corium and a spot at the apex white. Cuneus brown, base narrowly pale; membrane large, smoky, with a whitish patch below the apex of the cuneus. Legs and antennæ red, the apical half of the first joint and base of the second paler, extreme apex of fourth whitish.

Undeveloped form like the above, without cuneus or membrane.

Length 2 lines.

On *Erica.* Reigate Heath, Woking, Plumstead, Thorn Moor (Yorkshire).

Developed form very scarce.

Campyloneura.

1. *virgula,* H.-Scff. Fig. Dougl. & Scott, Brit. Hem. pl. xii. fig. 10.

Head black-brown, slightly paler posteriorily. Thorax white, with a wide yellow-brown stripe across the middle. Scutellum ochreous. Elytra subtransparent, with fine yellow hairs; extreme lateral margin very narrowly black. Cuneus yellow; apex blood-red; legs ochreous. Antennæ: first joint red, second brown, third brown on its basal half, apex pale; fourth pale, apex and base narrowly brown. ♀ with a round spot on each side of the body near the apex black.

Length 2 lines.

On oaks, by beating, in summer; not rare.

Ætorhinus.

1. *angulatus,* Fall. Fig. Dougl. & Scott, Brit. Hem. pl. xi. fig. 4.

Elongate, green, shining, covered with black hairs; thorax with the sides sinuate, the posterior angles rather produced and black. Elytra with the suture below the scutellum very narrowly black; the lateral margin, just above the cuneus, is of a deeper green than the rest of the insect. Membrane very slightly dusky, with a dark spot

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a little distance below the apex of the cuneus; inner margin black. Legs with the tarsi and the extreme base of each tibia black. Antennæ brownish; first joint white at the extreme base and apex, then narrowly black, leaving the middle brown; second joint black at the extreme base and apex.

Length 2¾ lines.

Common on alders, in August and September.

Chlamydatus.

Sphyrocephalus, Dougl. & Scott.

I. Head and thorax black.
   a. Legs pale testaceous .. .. .. *ambulans.*
   b. Legs green or brown .. .. .. *caricis.*
II. Thorax pale .. .. *insignis.*

1. *ambulans*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. xi. fig. 5.

♂ Elongate; head, thorax and scutellum black; elytra ochraceous, the clavus infuscate, apex of lateral margin darker; cuneus margined with brown; membrane slightly dusky; legs testaceous; antennæ black, slightly paler towards the apex; body black.

♀ Black, generally with undeveloped elytra, short and stout; legs testaceous; antennæ black, base of third joint pale.

Length ♂ 2½ lines; ♀ 1¾ line.

Not uncommon; by sweeping in damp places.

2. *caricis*, Fall. Fig. Meyer. Capsidæ, tab. v. fig. 2 (*elegantulus*).

= *elegantulus*, Dougl. & Scott.

Head, thorax and scutellum black; elytra dull green, inwardly brown, covered with short, adpressed, ochreous hairs; membrane slightly dusky; legs in the ♂ brownish-testaceous, in ♀ green. Antennæ black; ♂ with a pale spot on each side of the head; ♀ brighter in colour than the ♂.

Length 2 lines.

Rare; in damp places, by sweeping; Wimbledon, Woking, Newcastle, Dorsetshire.

3. *insignis*, Dougl. & Scott. Fig. Ent. Month. Mag. vol. ii. p. 247 (woodcut).

Flavous; head black, with a greyish spot near each

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eye. Elytra yellowish-grey; membrane hyaline; nerves yellow. Antennæ black; first joint pale at the apex, second joint very narrowly whitish at the apex.

Length 1¼ line.

Esher; two specimens, in September.

Byrsoptera.

1. *rufifrons*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. xi. fig. 6.

♂ Elongate, winged; ♀ apterous, body suboval.

♂ Dark-brown, shining, clothed with deciduous golden hairs; cuneous flavous; membrane slightly dusky; legs clear testaceous. Antennæ: first joint pale, darker at the base; second joint black; third and fourth pale, slightly dusky towards the apex.

♀ Head red; thorax as in the ♂; elytra convex and wide, without cuneus or membrane, rounded at the apex, and not reaching to the apex of the body; legs clear testaceous. Antennæ pale testaceous; first joint black, second black at the apex.

Length ♂ 2 lines; ♀ 1½—1¾ line.

On nettles, &c. by sweeping; not uncommon.

Systellonotus.

1. *triguttatus*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. xii. fig. 2.

♂ Elongate; head and thorax black or blackish-brown; base of elytra and scutellum of the same colour; rest of the corium and clavus chocolate-brown, with a semilunate spot in the middle of the clavus, a transverse spot at the apex of the corium, and a second above the middle snow-white and shining; cuneus darker brown, membrane fuscous. Legs and antennæ brown.

♀ Much like an ant in shape, paler brown, with only rudimentary elytra, which have a snow-white band across the middle. Abdomen darker. Antennæ and legs reddish-brown; base of the second joint of the former pale.

Length 2 lines.

Found running on the ground. Chobham, Littlehampton, &c., &c.; not rare.

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Dicyphus.

I. Thorax largely and rugosely punctured .. .. *globulifer.*
II. Thorax not largely and rugosely punctured.
A. Tibiæ spotted .. .. *annulatus.*
AA. Tibiæ not spotted.
B. Third joint of antennæ not twice as long as apical joint .. .. *pallicornis.*
BB. Third joint of antennæ twice as long as the apical.
a. Underside of head, thorax and breast more or less piceous .. .. *errans.*
b. Underside of head, &c. pale .. .. *pallidus.*

1. *globulifer*, Fall. Fig. H.-Scff. Wanz. Ins. iii. fig. 271 (*alienus*).

Sub-ovate, elongate; head and thorax black, with a spot on each side of the former near the eye, and the front margin and dorsal line of latter, pale; the thorax sometimes is entirely greyish-ochreous, with the callosities black; surface of head smooth and shining, surface of thorax deeply and rugosely punctured. Elytra greyish-ochreous, or in some nearly black, clothed with brown hairs; sides and cuneus somewhat paler; apex of cuneus sometimes darker; membrane dusky. Tibiæ spotted with black. Antennæ black; extreme apex, and base of first joint, white.

Length 2 lines.

Lowestoft.

2. *annulatus*, Wolff. Fig. H.-Scff. Wanz. Ins. iii. fig. 270.

Greyish; a good deal smaller than the preceding, covered with long scattered black bristles; head black, with a white spot on the inner margin of each eye. Thorax with the front margin and dorsal line white, with several round brown spots in front. Scutellum brown, spotted with white. Elytra nearly unicolorous; the apices of the corium and clavus slightly darker. Legs with the thighs and tibiæ spotted with round brown spots. Antennæ black, with the base and apex of the first, second and third joints, and a band across the middle of the second, white: beneath black or pale.

Length 1¼ line.

Common on *Ononis*, and generally distributed.

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3. *pallicornis*, Fieb. Fig. Dougl. & Scott, Brit. Hem. pl. 12, fig. 5.

Pale ochreous or straw-coloured, with long scattered hairs; head with a more or less interrupted brown stripe on each side, between the eyes. Thorax more or less spotted with brown in front. Elytra clothed with long brownish hairs; apex of cuneus darker; legs straw-coloured; hind thighs with very indistinct spots. Antennæ pale; first joint slightly darker; apical joint longer in proportion to the third than in the following species.

Length 2 lines.

On foxgloves, &c., by sweeping. The undeveloped form, which is the common one, has no membrane or cuneus, and is rather smaller.

4. *pallidus*, H.-Scff. Fig. H.-Scff. Wanz. Ins. iii. fig. 269.

Elongate, very pale ochreous, first joint of the antennæ red; second at the apex, and the third and fourth, brownish; corium sometimes with a black spot just above the cuneus; the apex of cuneus occasionally, and the nerves of the membrane, brown. Thighs with very small black or brown spots, beneath pale.

Length 2¾ lines.

By sweeping in damp places; not rare.

Very like the following, but differs in the thicker antennæ, and the paler colour especially of the underside; otherwise it might well pass as a variety.

5. *errans*, Wolff. Fig. Dougl. & Scott, Brit. Hem. pl. xii. fig. 4.

Elongate, brown or ochreous; head with the sides, and generally two stripes on the vertex, darker. Thorax with long hairs, and with the sides underneath and often the posterior angles dark brown. Elytra finely pubescent; corium with its extreme apical angle, and a spot above the cuneus, brown; there is also often an elongate brown streak above the angle of the membrane; membrane with the nerves and a transverse streak below the apex of the cuneus red or brown; thighs spotted with black. Antennæ first joint red, the rest more or less brown, the base of the third narrowly pale. Underside of head, thorax and breast brown or reddish; body ochreous or fuscous.

Length 2¾ lines.

By sweeping on nettles, &c.; common.

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Macrolophus.

1. *nubilus*, H.-Scff. Fig. Dougl. & Scott, Brit. Hem. pl. xii. fig. 6.

Elongate, bright tender green, densely clothed with ochreous hairs; basal joint of the antennæ, eyes and a stripe from the eye to the thorax, and the apex of the tarsi, black; membrane hyaline, clouded with darker markings, nerves bright green.

Length 2¼ lines.

On *Stachys sylvatica;* not common.

Malacocoris.

1. *chlorizans*, Block. Fig. Dougl. & Scott, Brit. Hem. pl. xii. fig. 7.

Very pale, almost transparent green, covered with long fine yellowish hairs; head and thorax unspotted; elytra marbled with darker green; membrane somewhat milky, cells with a large green spot in each; antennæ pale, the extreme base of the second joint and the underside of the first black.

Length 2 lines.

Not uncommon on hazel in August and September.

Pilophorus.

a. Claval band of the elytra, situated well above the posterior band of corium .. .. *clavatus.*
b. Claval band uniting the posterior bands of corium .. *bifasciatus.*

1. *clavatus*, Linn., nec Dougl. & Scott.

Brown; head and thorax with a bronzy tint; scutellum with a patch of silvery hairs on each side, and one at the apex. Elytra with a scattered golden pubescence; corium with two silvery bands, one above the middle, the other below; base of the cuneus also with a narrow silver band inwardly; clavus with a narrow silvery band just above the apex, but situated well above the bands of the corium. Legs and antennæ reddish-brown; second joint of latter clavate and darker at the apex; third and fourth joints with the bases pale.

Length 2 lines.

On sallows, &c.; Woking, Lewisham, &c.

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2. *bifasciatus*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. xi. fig. 8.
= *cinnamopterus*, Dougl. & Scott.
= *perplexus*, Dougl. & Scott.

So closely allied to the former that the differences only need be pointed out. The head and thorax are without the bronzy tint; the second joint of the antennæ is more curved and less regularly clavate. The elytra are devoid of the scattered golden pubescence; the band across the clavus is situated between the bands of the corium so as to unite them; besides these characters the insect is narrower.

Length 2 lines.

On oaks, firs, &c.; often in company with *Formica rufa*.

Halticus.

a. Head and thorax flavous .. .. *luteicollis.*
b. Head and thorax black .. .. *pallicornis.*

1. *luteicollis*, Panz. Fig. Dougl. & Scott, Brit. Hem. pl. xxi. fig. 1.

Shining, head and thorax flavous; the latter narrowly darker posteriorly. Elytra black, much widened posteriorly; smooth, with a fine grey pubescence. Membrane dusky black. Femora dark brown, with the apices pale; tibiæ and tarsi pale; the base of the posterior ones darker; apical joint of the tarsi black. Antennæ very long, flavous; the extreme apex of the second joint black.

Length 1¼ line.

On *Galium*, &c.; Stroud, S. Wales, &c.

2. *apterus*, Linn. Fig. Hahn, Wanz. Ins. i. fig. 61.
= *pallicornis*, Dougl. & Scott.

Black, shining, covered with a short grey, rather scattered pubescence. Membrane blackish. Femora black, the apices flavous; tibiæ and tarsi pale, apex of latter black. Antennæ flavous fuscous towards the apex.

Length 1⅛ line.

By sweeping, &c.; Darenth, Reigate, Headley, &c. The developed form is rather rare.

Stiphrosoma.

a. Black, with head and legs red .. .. .. *leucocephalum.*
b. Ferruginous, pale .. .. *luridum.*

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1. *leucocephalum*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. xxi. fig. 2.

Head very wide, reddish-yellow, smooth, shining, very finely and remotely punctured. Thorax deeply punctured. Elytra finely grey pubescent. Legs yellow, finely and densely hairy; tarsi fuscous. Antennæ: first joint yellow, rest black.

Length 1¾—2 lines.

By sweeping; occasionally; Scarborough, Reigate, Mickleham, &c.

2. *luridum*, Fall. Fig. H.-Scff. Wanz. Ins. iii. fig. 312.

Ochreous or ferruginous; very short and convex, and covered with a dense ochreous pubescence. Head shining. Thorax rugosely punctured. Scutellum smooth, impunctate. Membrane dusky. Legs pubescent. Antennæ fuscous; apex of first joint ochreous.

Length 1¾—2 lines.

By sweeping; Weybridge, Esher, &c.

Heterocordylus.

a. Legs with the tibiæ red; second joint of antennæ in ♀ not incrassated .. .. *tibialis*.

b. Legs entirely black; second joint of antennæ in ♀ strongly incrassated .. .. *unicolor*.

1. *tibialis*, Hahn. Fig. Hahn, Wanz. Ins. i. fig. 66.

Black, covered with short, deciduous, golden, scale-like pubescence, and with very fine, short, grey hairs. Thorax transversely rugose; elytra in the male with the sides subparallel; in the ♀ diverging posteriorly; femora black, reddish-yellow at their extreme apices; tibiæ reddish-yellow, dusky at the base and apex. Antennæ black; basal joint in ♀ shorter than in ♂. Membrane dusky, nerves brown.

Length 2¼—2½ lines.

Common on *Spartium scoparium*. June and July.

2. *unicolor*, Hahn. Fig. Hahn, Wanz. Ins. ii. fig. 179.

Entirely black, covered with short, whitish, scale-like pubescence, and with very fine, short, greyish hairs. Membrane nearly black, with a whitish spot below the apex of the cuneus; second joint of antennæ in ♂ slightly, in ♀ strongly incrassated.

Length 2—2¼ lines.

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On *Genista*, &c.; not common; Isle of Wight; Northumberland, Wales, &c.

Orthocephalus.

1. Legs black, margin between the clavus and corium ochreous .. .. *coriaceus.*
2. Legs with the tibiæ red. Elytra entirely black .. *saltator.*

1. *coriaceus*, Fab. Fig. Hahn, Wanz. Ins. ii. fig. 181 (*pilosus*).
= *mutabilis*, Dougl. & Scott.

Black, covered with long black hairs and a short fragmentary golden deciduous pubescence. Elytra with the suture between the clavus and corium ochreous. Membrane dusky; cells and a wide margin round them paler, the paler portion often with several small, round, dark spots. ♀ undeveloped.

Length 2—2¼ lines.

By sweeping; Chobham, Weybridge, &c.

2. *saltator*, Hahn. Fig. Dougl. & Scott, Brit. Hem. pl. xiv. fig. 2 (form *brachypt.*).

Black, longer and not so densely hairy as the preceding, but with the pubescence of a similar nature. Entirely black above. Tibiæ reddish-yellow, except at the apex. Membrane entirely fuscous, with a faint pale spot below the apex of the corium. ♀ undeveloped.

Length 2¼—2⅓ lines.

Commoner than the preceding; by sweeping. Widely distributed.

Loxops.

1. *coccineus*, Westerh. Fig. Meyer, Capsidæ, pl. iv. fig. 5 (unnatural).

Orange-red, covered with scattered yellowish hairs; sides of the thorax broadly red, or red-brown. Scutellum with a pale spot on the disk and one on each side of the base. Elytra orange-red or red-brown, more or less variegated with pale spots. Membrane slightly dusky; nerves red. Antennæ and legs orange-yellow; posterior thighs and basal joint of antennæ red; second joint twice as long as the third and fourth together.

Length 2 lines.

On ash trees, by beating; August and September.

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Orthotylus.

I. Elytra without black hairs.
- A. Species brownish-grey, with yellow markings .. *bilineatus.*
- AA. Species green.
  - B. Cell nerves of membrane green.
    - C. First joint of antennæ black beneath .. .. *striicornis.*
  - CC. First joint of antennæ not black beneath.
    - D. Apical joint of antennæ not nearly half so long as the third .. .. *prasinus.*
    - DD. Apical joint of antennæ half as long as, or nearly half as long as, the third.
      - a. Smaller, elytra very thin and diaphanous *diaphanus.*
      - b. Larger, elytra not thin and diaphanous.. *nassatus.*
  - BB. Cell nerves of membrane yellow or pale.
    - C. Apical joint of antennæ half as long as third.. *flavinervis.*
    - CC. Apical joint of antennæ not nearly half as long as third .. .. *tenellus.*

II. Elytra with black bristly hairs, mixed with the paler pubescence.
- A. Cells of membrane green .. .. .. *flavosparsus.*
- AA. Cells of membrane not green.
- A*. Species greenish-grey .. .. *Saundersi.*
- A*A*. Species green.
  - B. Third and fourth joints of antennæ together not so long as second .. .. *Douglasi.*
  - BB. Third and fourth joints of antennæ longer than second.
    - C. Rostrum not reaching the posterior coxæ; posterior thighs not much thickened.
      - D. Second and third joints of antennæ subequal, not short and robust. Found on the furze and broom on heaths, &c.
        - a. Head not very wide, not nearly so wide as the base of the thorax .. .. *concolor.*
        - b. Head very wide, nearly as wide as the base of the thorax .. .. .. *chloropterus.*
      - DD. Second joint of antennæ decidedly longer than third; short and stout; found in salt marshes.. *rubidus.*
    - CC. Rostrum reaching beyond the posterior coxæ; posterior thighs much thickened .. .. *ericetorum.*

1. *bilineatus*, Fall. (Gen. *Ætorhinus*, Dougl. & Scott.) Greyish-brown; covered with a short pale pubescence. Head yellowish, with the dorsal line and a spot in front brown. Thorax dark brown in front and narrowly so at the sides, paler posteriorly; sides slightly sinuate. Scu-

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tellum yellow, with a triangular spot in the middle brown. Elytra greenish-brown; the clavus brown, except along its outer margin; corium slightly paler at the base. Legs greyish-yellow. Antennæ black; second joint more or less pale.

Length 2¼ lines.

Leicester, by sweeping, and Invercanny, Scotland.

2. *striicornis*, Kirsch.

Pale and somewhat transparent green, clothed with fine ochreous hairs; membrane pellucid, sometimes with a pinkish iridescence; the nerves bright and constant green. Antennæ rather shorter than in most of the species; first joint beneath with a black longitudinal streak, third joint not quite half as long as the second, apical joint a little more than half the length of the third.

Length 2—2⅓ lines.

On oaks; Reigate, Chobham, also at Eltham.

3. *prasinus*, Fall.

= *viridinervis*, Dougl. & Scott.

= var. ? *ochrotrichus*, Fieb.

Similar to the preceding in colour and pubescence, but rather more elongate. Antennæ much longer; third joint three-quarters as long as the second, apical joint not nearly half as long as the third, first joint not marked with black below.

Length 2⅓ lines.

Common by sweeping and on various trees.

4. *diaphanus*, Kirsch.

Allied to the two preceding species, but more like *striicornis* in shape; pale green, very finely and closely covered with ochreous hairs. Elytra very thin and diaphanous; cell nerves of the membrane bright green. Antennæ shorter than in either of the preceding and stouter; third joint three-quarters as long as second, fourth almost half the length of the third; apex of the third and the whole of the fourth brown or black.

Length 2 lines.

Lee and Eltham; August.

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5. *nassatus*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. xi. fig. 3.

Much larger and more robust than any of the preceding, green; becoming yellow on the head, scutellum and front of thorax after death; covered with fine ochreous hairs; ♂ subelongate, sides of the elytra subparallel; ♀ rather more oval. Legs green; tibiæ and tarsi black at the apex. Antennæ: first joint black or brown at the base, the rest ferruginous; second joint one and one-half times as long as third; third not quite twice as long as fourth.

Length 3 lines.

Common on alders; July and August.

6. *flavinervis*, Kirsch.

Very like the preceding, but rather shorter; green, head yellow, apex of the cuneus and the lateral margins of the elytra more or less of the same colour; membrane dusky; cell nerves yellow. Antennæ: first joint black, the rest ferruginous, darker towards the apex; second joint one and one-half times as long as third; third not quite twice so long as fourth.

Length 2¾ lines.

On alders, with the preceding; July and August.

7. *tenellus*, Fall. Fig. Meyer, Capsidæ, pl. ii. fig. 3 (*angustus*).

= *angustus*, Dougl. & Scott.

Very pale and transparent ochreous-yellow, clothed with ochreous-brown hairs; membrane very slightly dusky. Eyes very promineut and black; second joint of the antennæ once and a quarter as long as the third and fourth together; apical joint not half as long as the third. Legs pale, with a greenish tint.

Length 2 lines.

On ash trees, not uncommon; Chobham, Reigate, Croydon.

8. *flavosparsus*, Sahlb.

= *prasinus*, Dougl. & Scott.

♂ Subelongate; ♀ suboval, green, sprinkled with small yellow spots, and clothed with black bristly hairs and occa-

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sional irregular patches of white silvery ones; after death the spots are often quite invisible; membrane hyaline; cells and cell nerves bright green. Antennæ: second and third joints subequal; fourth about half the length of third.

Length 2 lines.

On *Chenopodium*. Very common on the sea coast.

9. *Saundersi*, Reut.

= *obsoletus*, Dougl. & Scott (*Tinicephalus*).

Grey; head, thorax and legs with more or less of a greenish tint; upper surface clothed with silvery-white hairs and also with stronger brown ones. Elytra pale grey, somewhat diaphanous; base of the cuneus paler; membrane very slightly clouded, cells and a ⅂-shaped mark below the apex of the cuneus darker. Antennæ more or less testaceous or greenish.

Length 1½—1¾ line.

On *Spartium*, *Ulex*, *Genista*, &c. Common near London.

10. *Douglasi*, Saund.

Green, the sides of the elytra somewhat brownish-yellow; surface clothed rather thickly with white pubescence, intermixed with black hairs; membrane dusky; nerves yellow. Antennæ testaceous-brown; third joint about half as long as the second; fourth a little more than half the length of the third.

Length 2 lines.

On *Spartium*, Woking Heath. Common, but very local, in July; probably overlooked elsewhere.

11. *concolor*, Kirsch.

♂ = *virescens*, Dougl. & Scott.

Rather dark green when mature, paler green when young, densely clothed with long black hairs, intermixed with occasional whitish ones; head generally more or less brown; cuneus in ♂ often yellowish; membrane very dusky, nerves pale. Antennæ brownish; third joint as long or almost as long as second; fourth not quite one-third as long as third.

Length 2 lines.

Very common on *Spartium*, generally distributed.

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12. *chloropterus*, Kirsch. Fig. Ent. Month. Mag. vol. iv. pl. ii. fig. 3, ♂.
♂ = *bicolor*, Dougl. & Scott.

Green, clothed with black hairs, intermixed with occasional white silvery ones; in the ♂ the head, thorax, scutellum, clavus and inner apical angle of corium are grey-brown; head very wide across the vertex; thorax shorter and wider than in most of the species, membrane dusky, iridescent. Antennæ: third joint as long as the second; fourth about a third the length of the third.

Length 2 lines.

On furze, &c.; common and generally distributed.

The ♀ is somewhat like *concolor;* but may be distinguished by its much wider head, shorter form and smaller size, and also by the yellow colour of the head.

13. *rubidus*, Put. Fig. Ann. Soc. Franc. 5th ser. iv. pl. vii. fig. 2.

Obscurely red or green (var. *Moncreaffi*), clothed with black hairs mixed with short silvery ones. In looking closely at the red specimens it will be seen that the ground colour of the surface is of a lurid pink, speckled all over with brighter red spots; the cuneus is of a deeper red, membrane slightly dusky, nerves pale. Antennæ: third joint four-fifths the length of second, fourth two-thirds as long as third.

Length 1½—2 lines.

Portsmouth, on *Salicornia*, August to October, and by searching amongst *Arenaria maritima*, &c. at Worthing; not uncommon, but scarcely mature early in June—both vars.

14. *ericetorum*, Fall.

Bright green, somewhat shining, sides of the corium, the cuneus and the veins of the membrane yellow; after death the head, front of thorax and scutellum become of the same colour; surface clothed with black hairs, sides of the elytra with finer pale ones, membrane dusky; hind thighs much enlarged.

Length 2 lines.

Common on *Erica*, &c., by sweeping, and generally distributed.

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Species dubia.

obsoletus, Dougl. & Scott, nec Fieb.?

After a careful examination of the type specimen (the only British one known), I came to the conclusion that it certainly did not belong to Fieber's species. I have, I regret to say, since had the misfortune to destroy this specimen, and therefore, under the circumstances, I fear I must leave the matter to be cleared up when more examples are found.

HETEROTOMA.

1. *merioptera*, Scop. Fig. Dougl. & Scott, Brit. Hem. pl. xiv. fig. 5.

Bronzy-brown or black, shining, covered with depressed white and short upright blackish hairs; membrane black, with a white spot on each side below the apex of the cuneus. Legs clear flavous or green. Antennæ black, first joint thick, round and densely hairy; second much flattened and dilated, also densely covered with black hairs; third and fourth filiform, brownish, their bases pale.

Length 2½ lines.

Common on nettles, &c., by sweeping.

ANOTHEROPS.

1. *setulosus*, Meyer. Fig. Dougl. & Scott, Brit. Hem. pl. xii. fig. 8.

♂ Subelongate; ♀ suboval. Head and thorax pale greenish-yellow, more or less covered with scattered stout black hairs; the former with a dorsal line and numerous round spots more or less confluent, the latter with a transverse spot below each callosity, the hind angles and a spot on each side of the base black. Scutellum same colour as the thorax, with the sides black and the base spotted with small black spots. Elytra dull greenish, finely punctured with black, and covered with a dense black pubescence; nerves pale and without hairs. Membrane dusky, nerves pale whitish. Legs greenish, thighs and tibiæ spotted with black; apices of latter and tarsi black. Antennæ: first joint spotted with black, rest more or less brownish.

Length 3 lines.

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Hoplomachus.

1. *Thunbergi*, Germ. Fig. Dougl. & Scott, Brit. Hem. pl. xiii. fig. 3.

Ochreous-brown, covered with scattered black hairs and very fine brown punctures. Head ochreous, with a brown spot on each side between the eyes; thorax with the dorsal line and front margin pale; callosities dark brown; scutellum dark at the base; elytra with the nerves and margins pale whitish; membrane dusky; beneath banded with brown and white; thighs spotted; tarsi and extreme apex of tibiæ black; antennæ dusky at the apex.

Length 2 lines.

By sweeping, Birchwood, &c.

Macrocoleus.

I. All the tibiæ with strong black spines or spine-like hairs.
  A. Greyish-green or brownish-green, with soft white hairs intermixed with brown ones.
    a. Smaller, elytra uniform in colour, without transverse band .. .. *hortulanus*.
    b. Larger, elytra pale greyish-green, with a wide darker transverse band .. .. *molliculus*.
  AA. Orange or greenish-yellow, covered with strong black bristly hairs, not mixed with pale ones .. .. *tanaceti*.

II. All the tibiæ not spiny (hind ones spiny in *Paykullii*).
    a. Black hairs of the elytra so disposed as to form irregular spots .. .. .. *Paykullii*.
    b. Black hairs of the elytra not so disposed.. *solitarius*.

1. *hortulanus*, Mey.
= *tanaceti*, Dougl. & Scott (*Oncotylus*).
= *sordidus*, Dougl. & Scott (*Macrocoleus*).

Brownish-green, head and thorax generally of a brighter green, clothed with brown hairs mixed with pale ones; base of the cuneus narrowly pale, membrane dusky, nerves pale, thighs spotted at the apex, tibiæ spiny.

Length 1¾ line.

On *Ononis*, Reigate Hill, Headley Lane, &c.

2. *tanaceti*, Fall. (nec Dougl. & Scott).

♀ Suboval, golden or orange-yellow or greenish-yellow, densely covered with black bristly hairs, sparingly intermixed on the head and thorax with a few whitish ones. Membrane subpellucid, nerves golden yellow, surrounded by a dusky cloud, cells clouded. Beneath palely pubes-

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cent, with a few bristly black hairs. Legs covered with black hairs. Tibiæ with strong black spines. Antennæ hairy.

Length 2 lines.

On *Tanacetum*, Chobham, August. Three specimens, ♀.

Closely allied to *molliculus*, but differs from it in colour and the absence of the dark band of the elytra, and the downy pubescence so characteristic of that species.

3. *molliculus*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. xii. fig. 9.

Greyish-green, densely clothed with brown hairs, intermixed with whitish ones. An irregular wide band across the centre of the corium, and the cuneus, except at the base, darker. Legs greenish-grey; tibiæ with fine black spines. Apex of tarsi black. Membrane slightly dusky; lighter near the apex of the cuneus, with a darker spot just below it.

Length $2\frac{1}{4}$—$2\frac{1}{2}$ lines.

On *Achillea*, *Tanacetum*, &c.; not rare.

4. *Paykullii*, Fall. Fig. Meyer, Capsidæ, pl. v. fig. 1 (*maculipennis*).

Green, very densely clothed with strong black hairs. Head, thorax and scutellum sometimes darker. Hairs on the elytra somewhat irregularly disposed in patches, so as to give them a spotted appearance. Membrane blackish; nerves and a spot below the apex of the cuneus white. This latter pale spot is crossed by a well-defined quadrangular black spot. Legs and antennæ densely hairy; posterior tibiæ with a few longer spine-like hairs.

Length $1\frac{1}{3}$ line.

On *Ononis*; common where it occurs, but local.

5. *solitarius*, Meyer. Fig. Meyer, Capsidæ, pl. v. fig. 4.

Greyish-green. Head and thorax and scutellum sometimes brighter green; entire insect covered with black hairs. Nerves of the corium and the inner angle of the cuneus paler; membrane dusky; nerves and a space outside them clear and hyaline, the clear colour extending outwards in a narrow triangle towards the side. Legs densely hairy.

Length $2\frac{1}{2}$—$2\frac{3}{4}$ lines.

Rare; by sweeping on *Stachys*, &c.; Reigate.

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Amblytylus.

1. *affinis*, Dougl. & Scott. Fig. Dougl. & Scott, Brit. Hem. pl. xxi. fig. 3.

Elliptic, very pale-ochreous, clothed with black hairs, intermixed with white silvery ones. Nerves of the elytra somewhat paler. Antennæ: second and third joints subequal; fourth a little more than one-third as long as third. Thorax with the sides slightly margined.

Length 2 lines.

Occasionally by sweeping; Reigate, Eltham, &c.

Conostethus.

I. Third joint of antennæ longer than second..	.. *salinus*.
II. Third joint of antennæ not so long as second	.. *roseus*.

1. *salinus*, Sahlb. Fig. Sahlb. Hem. ryska Karelen, pl. x. fig. 3, 4.

♂ Elongate; ♀ suboval. Grey. Head flavous, with a brown spot on each side of the base in the ♂. Thorax with the dorsal line and lateral margins flavous; sides and base sinuate. Scutellum with the base and dorsal line flavous. Elytra with the sides and cuneus pale. Membrane dusky. Legs ochreous. Antennæ subrobust, black or brownish; in ♀ sometimes paler at the base; beneath greyish; sides flavous; ♀ generally paler than ♂.

Length 2 lines.

Near Gravesend; on *Arenaria maritima*, &c.

2. *roseus*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. xiii. fig. 4.

♂ Brownish-grey; a triangular spot above the mouth, dorsal line and sides of the thorax, and dorsal line of scutellum and the sides of the elytra, pale-ochreous. Membrane dusky. Legs and antennæ brownish-grey.

♀ Head, thorax and scutellum greenish-yellow; dorsal line and sides of the thorax and scutellum paler. Elytra bright rosy-pink or orange-coloured internally; sides flavous. Membrane slightly dusky. Legs and antennæ greenish.

Length 1¾ line.

Common, but local; by sweeping by roadsides, &c.

A variable species.

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Oncotylus.

1. *decolor*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. xiii. fig. 2.

♂ Elongate; ♀ suboval. Grey or brownish-grey, very finely and shortly pubescent. Head luteous, with the sides brownish-grey. Scutellum luteous at the base. Elytra with the sides widely pale. Membrane dusky. Cuneus entirely pale. Legs and antennæ brownish-grey.

Length 2 lines.

Common, by sweeping grass, &c. in dry places.

Harpocera.

1. *thoracica*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. xv. fig. 3.

♂ Subelongate. Head and thorax brownish-black, the dorsal line of the former and a short dorsal line at the base of the latter pale. Elytra brown, densely clothed with long grey hairs. Cuneus widely pale at the base. Legs testaceous. Apex of posterior femora, extreme apex of each tibia and the tarsi, black. Tibiæ with short black spines. Antennæ: second joint about the same length as first but thinner, and looked at from the side, curved and much thickened at the apex; third longer than first and second together, fourth about equal to the first.

♀ Wider and more ovate than ♂; pale greyish-yellow, sometimes black-brown. Head black, with the dorsal line and a transverse line on the vertex pale. Thorax with the callosities black, dorsal line narrowly pale. Scutellum black; apex pale. Apex of cuneus black; legs as in ♂. Antennæ: second joint not thickened and curved as in ♂ and rather longer.

Length 3½ lines.

Occasionally by sweeping and beating. Dr. O. M. Reuter says that in Finland it occurs on oaks.

Phylus.

I. Insect pale, head black .. .. *melanocephalus.*
II. Head of the same colour as the rest of the insect.
A. Cuneus concolorous with the corium.
a. Insect pale golden .. .. .. *palliceps.*
b. Insect brown, black or dark brown .. *coryli.*
AA. Cuneus always reddish, corium sometimes darker, sometimes lighter .. .. *avellanæ.*

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1. *melanocephalus*, Linn. Fig. Dougl. & Scott, Brit. Hem. pl. xi. fig. 7.

Elongate, yellow or reddish-yellow, covered with a fine golden pubescence. Head black. Thorax trapeziform. Elytra very long, parallel-sided. Membrane rather short, slightly dusky. Legs and antennæ pale; base of the first joint of the latter black.

Length 2½—3 lines.

On oaks, &c., by beating.

2. *palliceps*, Fieb.

Like the preceding, but having the head of the same colour as the thorax.

Length 2½—3 lines.

On oaks, &c., by beating.

I have great doubts as to the distinctness of the two above species, but never having seen any connecting links between the forms, I give them separately; they are found in the same places, often on the same trees.

3. *coryli*, Linn. Fig. Hahn, Wanz. Ins. i. fig. 16.

Black-brown, shining, clothed with very short grey hairs, similar in general form to the preceding but shorter. Elytra slightly punctured. Membrane dusky, with a white streak bordering the cuneus. Legs and antennæ testaceous.

Length 2½ lines.

On hazel; not rare.

4. *avellanæ*, H.-Scff. H-Scff. Wanz. Ins. vi. fig. 670.

Like the preceding but reddish-brown or paler. Cuneus always reddish-brown, so that in pale examples it is darker than the rest of the elytra, in dark ones lighter; two apical joints of antennæ also longer proportionately to the second than in *coryli*.

Length 2½ lines.

On hazel; common.

Atractotomus.

1. *mali*, Meyer, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. xiv. fig. 4 (*magnicornis*).

Black-brown or reddish-brown, covered with fine grey hairs, and a dense golden deciduous pubescence. Membrane blackish, nerves and a spot below the apex of the

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cuneus pale. Thighs black; tibiæ pale, with their extreme apex and sometimes the base more or less brown. Antennæ: first and second joints black, first short and thick, second long, much thickened and densely hairy, third and fourth filiform, together slightly longer than the second, pale, especially the base of the third.

Length $1\frac{1}{2}$—$1\frac{3}{4}$ line.

Occasional by beating, &c.

Psallus.

I. First and second joints of antennæ black, or partly so.
  a. ♂ Antennæ entirely dark; ♀ second joint dark at the base and apex .. *betuleti.*
  b. ♂ Third and fourth joints of antennæ pale; ♀ second joint pale, apex black *ambiguus.*

II. Antennæ entirely pale.
  A. Posterior thighs not spotted.
  A*. Cuneus entirely dark .. .. .. *obscurellus.*
  A*A*. Cuneus pale at the base.
  B. Species brown or red.
  C. Thighs dark brown or black .. .. *variabilis.*
  CC. Thighs bright red.
    a. Smaller and broader, reddish; thighs short; pubescence golden .. .. *simillimus.*
    b. Larger and narrower, brown; thighs long; pubescence white .. .. *querceus.*
  BB. Species entirely pale flavous .. .. *Fieberi.*
  AA. Posterior thighs spotted, sometimes entirely dark, but even then darker spots are visible.
  B. Densely covered with long, thick, silvery-white deciduous hairs .. .. .. *Rotermundi.*
  BB. Not covered with silvery hairs.
  C. Cuneus entirely white.
    a. Posterior thighs dark .. .. .. *salicellus.*
    b. Posterior thighs not dark .. .. *sanguineus.*
  CC. Cuneus not entirely white.
  D. Colour obscure brown .. .. .. *lepidus.*
  DD. Colour not obscure brown.
  E. Thighs spotted more or less all over.
    a. Cuneus widely pale at the base; narrowly at the apex .. .. .. *roseus.*
    b. Cuneus narrowly pale at the base; not pale at the apex .. .. .. *alnicola.*
  EE. Thighs spotted only at the apex.
    a. Apical joint of antennæ about half as long as the third .. .. .. *varians.*
    b. Apical joint of antennæ considerably more than half as long as the third.. *Kirschbaumi.*

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1. *betuleti*, Fall. Fig. H.-Scff. Wanz. Ins. vi. fig. 602 (*ambiguus*).
= *ambiguus*, Dougl. & Scott.

♂ Subelongate, black, covered with golden deciduous hairs; base of the cuneus widely pale; membrane black, with a white spot below the apex of the cuneus. Thighs black, apices paler; tibiæ pale, with black spines, springing from small black spots, slightly darker towards the extreme apex.

♀ Reddish-ochreous; head, callosities and base of thorax, a triangular patch on each elytron, and the antennæ, with the exception of the middle of the second joint, more or less black.

Length 2½ lines.

On birches, &c.; not uncommon.

2. *ambiguus*, Fall.
= *obscurus*, Dougl. & Scott.

Smaller than the preceding; ♂ differing in having the third and fourth joints of the antennæ pale; the posterior tibiæ darker, and being slightly less elongate in shape.

♀ Differs in the duller colour, shorter form, in having the second joint of the antennæ pale, with the apex black, and the third and fourth luteous as in the ♂.

Length 2 lines.

On apple trees, &c.; not rare.

3. *variabilis*, Fall. Fig. Meyer, Capsidæ, pl. iii. fig. 4.
= *Whitei*, Scott.

♂ black, covered with short, golden, deciduous hairs, which are very easily rubbed off; cuneus narrowly pale at the base; ♀ head and thorax black; elytra ochreous, the lateral margins often reddish, with a large triangular spot on each above the cuneus; cuneus widely pale at the base; membrane dusky, with a pale spot below the cuneus. Antennæ pale; thighs black, apex of the first and second pairs pale.

A very variable species, varying especially in the darkness of the patches on the elytra, which are sometimes scarcely visible.

Length 1½ line.

On oaks; very common.

4. *obscurellus*, Fall.

Small and subelongate, brown, densely covered with whitish, deciduous, scale-like hairs; cuneus entirely

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brown; thighs brown, apices paler; tibiæ ochreous, with rather slender black spines, the hind pair darkest. Antennæ pale, first joint brown.

Length 1½ line.

On firs, &c.; not rare.

5. *quercus*, Kirsch. Dougl. & Scott, Brit. Hem. pl. xiii. fig. 8.

Sub-elongate, brown. Head and thorax slightly darker. Insect covered with short, whitish, deciduous hairs. Cuneus reddish-brown; the base and extreme apex narrowly paler; thighs red, the posterior ones very long. Tibiæ pale ochreous, with strong black spines. Antennæ ochreous or reddish.

Length 2 lines.

On oaks, rare; Darenth, &c.

6. *simillimus*, Kirsch.

Much smaller and shorter than the preceding; bright clear red. Head and thorax yellowish, deciduous pubescence of the elytra golden; base of cuneus very narrowly white. Membrane dusky, with a pale spot below the apex of the cuneus. Thighs bright red; tibiæ pale ochreous, with strong black spines. Antennæ pale ochreous.

Length 1½ line.

On maples; Box Hill, Mickleham, &c.

7. *Fieberi*, Dougl. & Scott.

Entirely pale ochreous-yellow; surface covered with rather long concolorous hairs; base of the cuneus widely transparent. Membrane hyaline. Thighs unspotted; tibiæ with black spines.

Length 1½ line.

Common at Shirley and Croydon, on palings; June and July.

8. *Rotermundi*, Scholtz. Fig. Dougl. & Scott, Brit. Hem. pl. xiii. fig. 6.

Short, oval, greyish-white, densely clothed with thick silvery hairs. Thorax with a black line across each callosity. Elytra with two longitudinal darker spots. Cuneus bright red, with the base widely pale. Femora spotted with brown; often red underneath. Tibiæ red at the base; apex of tarsi black.

Length 1½ line.

On white poplars; Reigate, Blackheath, &c.

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9. *salicellus*, Mey. Fig. H.-Scff. Wanz. Ins. vi. fig. 605.

Pale whitish, surface with irregular patches of silvery hairs intermixed with black ones. Thorax and elytra more or less sprinkled with brown, puncture-like spots. Cuneus white. Membrane dusky, with a pale spot below the apex of the cuneus; a darker spot below it, and then another paler one. Thighs spotted, posterior ones dark brown. Tibiæ and antennæ whitish, the former with strong, black spines.

Length 1¾ line.

On hazel, &c.; not rare.

10. *sanguineus*, Fab. Fig. H.-Scff. Wanz. Ins. iii. fig. 226.

= *querceti*, Fall.

= *dilutus*, Dougl. & Scott.

Shorter than the preceding and less graceful in shape, with much shorter antennæ, and with pale hind thighs.

Var. *sanguineus*. Bright crimson. Head and thorax generally showing more or less signs of paler spots. Cuneus white; thighs red, spotted with black at the apex.

Var. *querceti*: ground colour pale whitish, more or less sprinkled with crimson spots. Cuneus white. Membrane in all the varieties slightly dusky, with the cells posteriorly darker, and with a dark transverse band below the apex of the cuneus, the dark colour continuing round the cells. The membrane is paler below this, and clouded again at the apex. Very pale specimens are the var. *dilutus*.

Length 1½ line.

On sallows, &c.; common; all the varieties occur together.

11. *lepidus*, Fieb.

Brown, clothed with golden hairs. Corium, especially in the ♀, with a more or less reddish tinge. Cuneus red, narrowly pale at the base. Membrane dusky, with a pale spot below the apex of the cuneus; nerves whitish. Thighs brown, spotted with black. Antennæ pale; second joint in the ♂ thicker than in the ♀.

Length 1¾ line.

On ash trees; not rare.

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12. *roseus*, Fall.
= *salicis*, Dougl. & Scott.

Bright red or brownish-red; ♂ with the sides of the elytra subparallel; pubescence golden, mixed with black hairs. Elytra with a darker triangular spot above the cuneus. Cuneus widely pale at the base, narrowly at the apex. Legs pale ochreous; thighs spotted with black. Membrane dusky; cells, except at their extreme apex and two transverse spots below the cuneus, paler.

Length 1½—1¾ line.

On sallows and birches, &c, by beating; not rare.

13. *alnicola*, Dougl. & Scott.
= *alni*, Dougl. & Scott, nec Fab.

Very like the preceding, but differs from it in being more densely pubescent, and in having the pubescence arranged in irregular patches on the elytra; the cuneus also is only very narrowly pale at the base, and concolorous at the apex.

Length 1½ line.

On alders; Lewisham, Esher, &c.

14. *varians*, H.-Scff. Fig. Dougl. & Scott, Brit. Hem. pl. xiii. fig. 7.
= *distinctus*, Dougl. & Scott.

Orange-red, covered with deciduous golden hairs intermixed with black ones; base of the elytra often paler. Cuneus red; base widely, and apex white; extreme apex of the corium, at its juncture with the cuneus, also sometimes white. Membrane dusky; cells at the base and a spot below the apex of the cuneus clear; below this latter is an irregular dusky cloud. Thighs spotted at the apex.

Length 1¼—2 lines.

Very common on oaks, &c.; June and July.

Very variable in colour and size; sometimes almost entirely pale flavous, at others brownish.

15. *Kirschbaumi*, Fieb.
= *roseus*, Dougl. & Scott, nec Fall.

Head, thorax, scutellum and clavus more or less ochreous, sometimes with minute red spots. Corium more or less red, with a darker triangular patch near the apex. Cuneus bright red, very narrowly pale at the extreme

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base. Membrane very dark, with a pale spot below the apex of the cuneus; second joint of the antennæ in the ♂ slightly thickened; apical joint two-thirds as long as the third, or more. Thighs spotted at the apex.

Length 1¾ line.

On ashes; Chobham, Reigate, Dartford, &c.

Narrower than *varians*, and distinguishable by the shorter third joint to the antennæ, the very narrow pale base to the cuneus, and the clouded spot on the elytra.

Plagiognathus.

I. Tibiæ with strong black spines springing from small black spots.
  A. Hind margin of the head strongly carinated and slightly produced .. .. .. *Roscri.*
  AA. Hind margin of the head not strongly carinated.
    B. Pubescence thick, black, and deciduous.
      a. First and second joints of antennæ pale *viridulus.*
      b. First and second joints of antennæ black *arbustorum.*
    BB. Pubescence thick, dense, and silvery .. *albipennis.*
    BBB. Pubescence fine, grey, and adpressed.
      C. Larger, a pale spot on each side of the head inside the eyes.
        a. Base of the elytra widely pale .. .. *Bohemanni.*
        b. Elytra entirely brown .. .. .. *nigritulus.*
      CC. Smaller; head entirely dark.. .. .. *pulicarius.*

II. Tibiæ with fine hair-like spines not springing from black spots.
      a. Base of the elytra pale .. .. .. *saltitans.*
      b. Base of the elytra concolorous .. .. *Wilkinsoni.*

1. *albipennis*, Fall. Fig. Hahn, Wanz. Ins. ii. fig. 177.

♂ Elongate; ♀ suboval, green or blackish-grey, densely clothed with silvery-white hairs. Head, thorax in front, scutellum, apex of the clavus, and a spot near the apex of the corium, sometimes darker. Cuneus pale at the base, darker at the apex. Membrane dusky, with a pale spot below the apex of the corium; thighs brown; tibiæ whitish, with large, thick, black spines. Antennæ: first and second joints black, apex of the second and the third and fourth often yellowish.

Length 1½ line.

On *Artemisia maritima*, Hayling Island, and *Artemisia absinthii*, gardens, Reigate; common.

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2. *viridulus*, Fall. Fig. Meyer, Capsidæ, pl. vii. fig. 2, ♀.
Pale yellowish-green, densely clothed with black deciduous hairs. Membrane generally with a dark transverse line below the apex of the cuneus; cells sometimes dark at the apex; thighs finely spotted with black; tibiæ with black spines. Antennæ testaceous; first joint black at the base, and with a dark ring near the apex; second black at the extreme base, and sometimes slightly dusky at the apex.
Length 1¾—2 lines.
Very common; on nettles, &c.

3. *arbustorum*, Fab. Fig. Dougl. & Scott, Brit. Hem. pl. xiii. fig. 5.
Black, brown, or pale greyish-brown; cuneus sometimes paler, sometimes concolorous, densely clothed with black deciduous hairs. Membrane blackish, with a clear spot below the apex of the cuneus. Legs pale; thighs margined with black on each side, and more or less spotted; tibiæ with thick black spines. Antennæ: first, second and extreme base of the third black; apex pale.
Length 2 lines.
Very common; on nettles, &c., in all its varieties; by sweeping.

4. *Roseri*, H.-Sch. Fig. H.-Sch. Wanz. Ins. iv. fig. 407, ♀.
Head carinated posteriorly, black; the eyes usually margined with brownish-yellow. Thorax either entirely black, or testaceous with the callosities black or red. Scutellum black or red. Elytra flavous, finely pale pubescent. Corium either with a broad black vitta, extending from some distance below the base to the interior apical angle, or entirely pale. Cuneus red, with the base pale or entirely pale. Femora red, with the bases black. Antennæ: first and second joints black, third and fourth paler, or with the first reddish, darker at the base, second broadly pale in the middle.
Length 1¾ line.
Sallows, &c.

5. *Bohemanni*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. xiii. fig. 9.
Shining brown or blackish-brown, clothed with very fine adpressed yellowish-white hairs. Head with a line

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inside each eye, and sometimes with the base pale. Thorax generally with a narrow, pale, dorsal line in front, sometimes also at the base. Scutellum with a pale spot on each side of the base; elytra with the base to a greater or less extent, and the cuneus at the base, pale whitish. Membrane dusky, with a clear spot below the apex of the cuneus. Thighs brown, pale at the extreme apex; tibiæ pale, with strong black spines. Antennæ black, apex of the first joint pale.

Length $1\frac{3}{4}$ line.

Common on dwarf sallows at Deal.

6. *nigritulus*, Fall. Fig. Scott, Ent. Ann. 1864, fig. 5 (*Scotti*).

= *Scotti*, Fieb.

Black or brown, covered with a fine adpressed, greyish pubescence. Head with a pale line bordering each eye on its inner margin. Scutellum sometimes with a yellow spot on each side. Cuneus entirely dark. Membrane dusky, with a clear spot below the apex of the cuneus. Femora dark brown, with the apices paler. Tibiæ pale, with black spines; tarsi with their apices black.

Length $1\frac{1}{3}$ line.

With the preceding, but rarer.

7. *pulicarius*, Fall. Fig. Dougl. & Scott, Brit. Hem. pl. xiv. fig. 1.

Small, black, shining, covered with a fine, adpressed, grey pubescence. Membrane dusky; apices of the femora pale. Tibiæ pale, with strong black spines. Antennæ with the third and fourth, and apex of the second joint, whitish.

Length 1 line.

On sallows, &c.; Deal, Wimbledon, Woking, &c. &c.

8. *saltitans*, Fall.

Head and thorax black; base of the former, and the inner margins of the eyes, pale. Elytra pale at the base and the extreme apex, the rest brown, covered with fine, adpressed, yellowish hairs; without cuneus or membrane, and not reaching much beyond the middle of the body. Thighs brown, with the apices paler; tibiæ testaceous, with fine, black, spiny hairs. Antennæ black, third joint brownish, fourth paler.

Length 1 line.

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By sweeping, occasional; Dawlish, Wimbledon, Reigate, &c. &c.

9. *Wilkinsoni*, Dougl. & Scott.

Smaller than the preceding, entirely brown, clothed with fine, grey, adpressed hairs. Elytra undeveloped, reaching to about the middle of the body. Legs with the thighs brown, paler at the apex; tibiæ testaceous, with fine spine-like hairs. Antennæ brown; apex of the first joint pale, third and fourth luteous.

Length $\frac{7}{8}$th line.

Scarborough, at the roots of *Convallaria*.

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XIX. *Descriptions of new species of* Endomychici.

By Rev. H. S. Gorham.

[Read 3rd November, 1875.]

ENDOMYCHICI.

Family EUMORPHIDÆ.

Genus Amphisternus, Germar.

Amphisternus sanguinolentus, n. sp.

Politus, niger, elytris nigro-cyaneis, crebre subtiliter punctatis maculis duabus sanguineis, unâ basilari rotundâ, alterâ prope marginem oblongâ medio constrictâ. Long. lin. 3½—4, ♂, ♀.

Mas, tibiis anticis medio fortiter dentatis, intermediis apice incurvis, abdomine segmento ultimo triangulariter exciso, circa excisionem elevato.

A remarkable species, at first sight resembling an *Encymon*; the bifurcate prosternum, clavate femora, and tooth in the middle of the front tibiæ of the male, leave me no alternative but to place it here, or create for it a new genus.

The head and thorax are glabrous, with a few fine and scattered punctures; lateral margins of the latter a little thickened and sinuous; basal sulci short, deep at base; width of thorax nearly twice the length. Elytra half as wide again as thorax at the base, ovate, blue-black; a blood-red round spot near the base; a broad vitta parallel to the margin, composed of two united spots of the same colour; their surface shining, finely, closely and distinctly punctured. Antennæ not very long; joints 4—8 little longer than wide; 9 triangular, as long as wide; 10, 11 transverse. Underside shining black; prosternum channelled and with the apex bi-mucronate.

Hab.—East Mindanao, Philippines. Dr. Semper.

Genus Engonius, Gerst.

Engonius signifer, n. sp.

Oblongus, subnitidus, crebre ac perspicue punctatus, thorace antice excavato angulis anticis prominulis retusis,

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lateribus opacis, medio canaliculato; elytris fasciis dentatis duabus flavis, anteriore humerum fere cingente. Long. lin. 4, ♀.

Black, elytra and disc of thorax shining, oblong-ovate. Thorax narrower than elytra, transverse; disc with a few punctures and distinctly channelled; sides reflexed, opaque. Elytra closely and distinctly punctured; sides scarcely widened below the middle; apex rounded. The anterior fascia has its extremities recurved towards the base, and is bidentate towards the apex; the second fascia has two teeth corresponding to those in the first, directed towards the base, and the extremities, and a median tooth directed towards the apex; neither fascia reach the suture nor extreme margin. Allied both to *E. annularis* and *E. lunulatus*, Gerst., the punctuation and form both of the thorax and of the markings is different from either.

Hab.—North India, F. Moore; also in British Museum.

Genus Encymon, Gerst.

Encymon ferialis, n. sp.

Niger, nitidus, glabratus, thorace subquadrato basin versus angustato, angulis anticis vix prominulis, elytris violaceo-micantibus fere impunctatis. Long. lin. 3, ♀.

Thorax shining, black, the width at the anterior angles a little greater than the length, the front margin but little excavated; sides parallel for one-third, below which they are excavated to the base, but not very strongly; disc rather convex between the basal sulci, which are deep.

Elytra rather short, strongly convex, suture depressed; of a dark purplish-violet, very obsoletely punctured, the punctures scarcely visible except near the scutellum. Legs, antennæ and underside shining black.

Hab.—Borneo. Coll. F. Chapuis.

Family LYCOPERDINIDÆ.

Genus Ancylopus, Costa.

Ancylopus indicus, n. sp.

Rufo-piceus, nitidus, crebre subtiliter punctatus, abdomine, elytris (maculâ humerali, margineque exceptis),

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capite, antennis, pedibusque nigris, tarsis rufis. Long. lin. 3, ♀ ?

Elongate, nearly parallel, rather smaller than *A. graphicus*. Head black, opaque; parts of the mouth pitchy red. Thorax of the width of the elytra, covered with small distinct punctures; sides finely margined, a little narrowed to the base; anterior angles prominent, acute, hind angles a little acute; disc with well-impressed basal sulci. Elytra widest below the middle, evenly and closely punctured, exhibiting an indistinct sutural stria, pitchy black with a square humeral patch, and the anterior two-thirds of the margin pitchy red. Legs and antennæ black, tarsi and extreme tips of the tibiæ red.

Hab.—North-west Himalaya. Coll. F. Moore; also two specimens in the British Museum.

Genus PHALANTHA, Gerst.

Phalantha pictipennis, n. sp.

Depressa, pallide testacea, breviter sub-pubescens, nitida, confertim punctata, elytris maculis duabus et antennarum articulis tribus penultimis nigris. Long. lin. 2, ♂, ♀.

Mas, tibiis anticis denticulo parvo triangulari prope apicem armatis.

Head small, eyes prominent, crown thickly punctured; antennæ nearly as in *P. exsanguis*, with the exception that only the *three* joints preceding the terminal one are black, the seventh and terminal entirely pale. Thorax transverse, hardly twice as wide as long; sides with a tooth-like projection nearer to the front angles than the base, giving the appearance of the anterior angles having been cut off. Margin slightly reflexed, basal sulci more evident than in *exsanguis*. Elytra sub-cordate, closely punctured, punctures confluent, varied with marking of a darker fuscous colour and with *two* round black spots, one on the disc near the suture, the other near the margin, and placed obliquely nearer the apex; of the fuscous markings the most distinct is a lunule connecting the discoidal spot with the suture, and in the examples in which it is most distinct forming a V; another less distinct spot on the suture before the apex. Legs pale testaceous; in the male the front tibiæ have a small tooth on their inner side near the apex, in the female the apex of the elytra is more truncate than in the male.

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Compared with *exsanguis*, this species is rather smaller and narrower, more shining and distinguished by the *three* black joints of the antennæ and two elytral spots.

Hab.—Pará, Amazons.

Family ENDOMYCHIDÆ.

Genus novum THELGETRUM.

Corpus breve, convexum. Antennæ ad apicem paululum incrassatæ, articulo tertio, secundo duplo longiore, quarto subæquali; articulis 5—8 sub-quadratis, 9, 10, 11 his longioribus, ultimo ovato.

Palpi maxillares apice truncato.

Pronotum transversum, elytris dimidio angustiore.

Prosternum latum, margine laterali tenuiter elevato apice recte truncato.

Pedes validæ, longæ, tarsi articulis duobus primis fortiter bilobis.

Type, *T. ampliatum*, n. sp.

T. ampliatum, n. sp.

Breviter convexus, ferrugineus, nitidus, subtiliter crebre punctatus; antennæ nigræ articulis duobus basalibus ferrugineis, ultimo læte testaceo. Long. lin. 2.

Head and thorax finely and closely punctured, shining, the latter transverse, half as wide again as long; sides parallel for two-thirds their length from the base, narrowed then to the acute front angles. Hind angles right. Basal sulci distinct, continued for half the length of the disc. Elytra strongly convex, widest about one-third from their apex, where they are fully twice the width of the thorax; humeral callus prominent. At the base the width of the elytra is once and a half that of the thorax, thence gradually widened for two-thirds their length, and evenly rounded at the apex. Scutellum small, triangular. Suture not elevated, even. Legs long, femora compressed, passing the elytra by half their length; tibiæ straight, a little thickened towards their apex. Underside shining.

Hab.—Philippine Islands. Coll. A. Chapuis.

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XX. *A List of the* Lepidoptera *referable to the genus* Hypsa *of Walker's List, with descriptions of new genera and species.* By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

[Read 3rd November, 1875.]

Family LITHOSIIDÆ.

Sub-family HYPSINÆ.

Genus HYPSA, *Hübner* (Type, *H. Silvandra*).

1. Hypsa silvandra.

Phalæna-Bombyx silvandra, Cramer, Pap. Exot. iv. p. 155, pl. 369, fig. D. (1782).

Hypsa silvandra, Hübner, Verz. bek. Schmett. p. 172, n. 7 (1816).

Java (*Horsfield*). B.M.

This species was in the Horsfield Cabinet, mixed up with *H. intacta* of Walker, from which it differs chiefly in the want of the central longitudinal white streak of primaries: the two insects may, I think, be variations of one species.

2. Hypsa intacta.

Hypsa intacta, Walker, Lep. Het. 2, p. 451, n. 10 (1854).

Java (*Henry, Horsfield, &c.*). Type, B.M.

3. Hypsa dama.

Noctua dama, Fabricius, Sp. Ins. ii. p. 216, n. 39 (1781); Donovan, Ins. New Holl. pl. 39, fig. 1 (1805).

Phalæna-Noctua dama, Gmelin, ed. Syst. Nat. 1, 5, p. 2545, n. 1049.

Aganais dama, Boisduval, Voy. de l'Astrolabe, 1, Lép. p. 250, n. 3 (1832—35).

Hypsa dama, Walker, Lep. Het. 2, p. 449, n. 6 (1854).

Rockingham Bay (*Macgillivray*); Aru (*Wallace*) B.M.

The type of *H. dama* is in the Banksian Cabinet: it agrees well with specimen "a" of Walker's *H. silvandra;*

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Donovan's figure is very incorrect, the white spotted space at the base of primaries being too extensive, and the white longitudinal streak much too broad.

4. Hypsa doryca.

Aganais doryca, Boisduval, Voy. de l'Astrolabe, 1, Lép. p. 251, n. 4 (1832—35).

Ceram (*Wallace*). B.M.

I found this species confounded in the collection with *H. lanceolata*, with which insect Walker identifies *H. doryca* in his Supplement, p. 212; the two forms are quite distinct.

5. Hypsa dicta, n. sp.

Allied to *H. silvandra:* wings narrower, no white veins, but with a distinct white streak on upper surface of primaries; secondaries with no black spot at end of cell, and the outer border narrower, excepting at apex, where it is broader: wings below quite different, brown; primaries yellow at base; a white spot or patch upon the median nervure; secondaries with a broad subtriangular patch on inner margin, leaving only the costal and outer margins broadly brown; a blackish spot at end of cell: body ochreous: expanse of wings 2 inches 5 lines.

Borneo (*Stevens*); Philippines (*Cuming*). Type, B.M.

Very like *H. lanceolata*, with which it was (in part) associated, but differing in the spotted yellow base of primaries, the narrower white streak, and the narrower brown border of secondaries.

6. Hypsa lanceolata.

Hypsa lanceolata, Walker, Lep. Het. 7, p. 1675 (1856).

Celebes (*Wallace*). B.M.

7. Hypsa monycha.

Phalæna monycha, Cramer, Pap. Exot. ii. p. 52; pl. 131, fig. C. (1779).

Coromandel.

8. Hypsa complana.

Hypsa complana, Walker, Lep. Het. Suppl. 1, p. 213 (1864).

Timor and Bouru. Type, Coll. Hope, Oxford.

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9. Hypsa subsimilis.

Hypsa subsimilis, Walker, Lep. Het. Suppl. 1, p. 212 (1864).

Singapore. Type, Coll. Hope, Oxford.

I have examined both sexes of this species from the collection of Lieut. Howland Roberts; the female is also in Mr. Moore's collection.

10. Hypsa clavata, n. sp.

Primaries very like *H. monycha* and *H. dicta*, but differing from both in the somewhat more clavate form of the white streak and the veins of basal half being white; secondaries with the outer border broader, undulated less irregularly on its inner edge; a large black spot at the end of discoidal cell, and occasionally two other spots, one small on the radial nervure close to the outer border, the other in the form of an oblique dash on interno-median interspace towards anal angle: body golden-yellow, collar and tegulæ black-spotted, abdomen with a dorsal series of five black spots; differences below much as above, but only the subcostal vein and the base of the costal, on basal area of primaries, white: expanse of wings 2 inches 8 lines.

Hong-Kong (*Bowring*), E. India, Silhet (*Sowerby*). Type, B.M.

This is the *H. silvandra* of Walker's Catalogue.

Mr. Moore has this species from Borneo and Silhet.

11. Hypsa heliconia.

Phalæna-Noctua heliconia, Linnæus. Syst. Nat. 1, ii. p. 839 (1767).

Hypsa heliconia, Hübner, Verz. bek. Schmett. p. 172, n. 1778 (1816).

Hypsa (*Aspa*) *heliconia*, Walker, Lep. Het. ii. p. 452, n. 11 (1854).

N. India (*James*), Silhet (*Sowerby*), Moulmein (*Clerck*), Saráwak (*Wallace*). B.M.

12. Hypsa persecta, n. sp.

Allied to *H. plana*, but the subcostal creamy spot of primaries smaller and distinctly separated by a brown band or line from the large creamy area; the ochraceous basal area paler, and the black spots upon it well separated and more clearly outlined; secondaries with the brown border narrow, not quite extending to the anal angle; a large

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black spot at end of cell, a second (cut by the radial nervure) upon discoidal interspace, a third upon interno-median interspace, and a fourth, smaller near anal angle; body paler yellow, tegulæ and collar with a small black spot on each side; abdomen much as in *H. plana;* primaries below with the external brown area more regular, transverse; a large black spot on discocellulars; discoidal spot large, rounded, and black; secondaries with costal border black, apical and external borders brown as above; six black spots, the additional one being placed in the middle of the discoidal cell; body below as in *H. plana:* expanse of wings 2 inches 3 to 9 lines.

♂ Ceylon (*Templeton*), ♀ Silhet (*Stainsforth*).
Type, B. M.

This species was confounded with *H. plana* by Mr. Walker, who in his diagnosis says, "posticæ sæpe maculis nonnullis murinis;" in the short description which follows he observes, "The spots on the hind wings are occasionally wanting," which would have inclined me to consider the Indian species as type, but the difficulty is settled by Moore, who figures the metamorphoses of the Javan species: the two things are entirely distinct.

Mr. Moore has this species from Canara, S. India; N. E. Bengal; and Formosa.

13. Hypsa albifera.

Aganais albifera, Felder, Reise der Nov. Lep. 4, pl. cvi. fig. 3 (1874).

Allied to the preceding.

Hab. —?

14. Hypsa clara, n. sp.

Allied to *H. plana*, but paler; primaries with brown areas, less irregular, much paler; a brown nebulous streak on interno-median interspace; base yellowish, with five well separated clearly defined black spots, also a black dot at the base; a brown spot near the base, on the inner margin; secondaries white, with two brown dots on interno-median interspace, and a brown subanal litura: head and collar pale ochraceous, the latter with two black spots; tegulæ white, with a black dot on the shoulder; thorax creamy, with a central anterior longitudinal pyriform black spot; abdomen ochreous, with a dorsal series of seven black spots: wings below white, primaries with apical area broadly pale brown; a large brown spot on discocellulars,

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and a cuneiform, brown, discoidal streak; secondaries with a subcostal nebulous rounded brown spot, and three subanal spots as above; pectus creamy whitish; venter creamy ochreous, with lateral series of black dots: expanse of wings 2 inches 5 lines.

Java (*Horsfield*). Type, B.M.

Mr. Moore has an example slightly darker, and with the spots rather blacker.

15. Hypsa speciosa.

Phalæna-noctua speciosa, Drury, Ill. Ex. Ent. ii. p. 10, pl. 5, fig. 2 (1773).

Hypsa speciosa, Walker, Lep. Het. 2, p. 460, n. 27 (1854).

Sierra Leone.

Allied to the preceding species.

16. Hypsa plana.

Hypsa plana, Walker, Lep. Het. ii. p. 450, n. 8 (1854); Moore, Cat. Lep. E. I. Comp. ii. p. 294, n. 675, pl. xiii. figs. 9, 9ª (1858—9).

Java (*Horsfield*). Type, B.M.

We have six examples of this species, exhibiting no tendency to vary; the body alone would readily distinguish it from *H. clara*, as the tegulæ are ochreous, heavily *streaked* with black, and the abdomen is transversely *banded* with black: the wings are, however, differently coloured.

17. Hypsa? tortuosa.

Neochera tortuosa, Moore, Proc. Zool. Soc. p. 570, pl. xxxiii. fig. 2 (1872).

India. Type, Coll. Hope, Oxford.

This beautiful species seems to me to be related to the four preceding species rather than to *Neochera*; it has, moreover, the same extremely long palpi.

Subgenus Damalis, *Hübner* (Type, *D. caricæ*, Fabr.)

18. Hypsa alciphron.

Phalæna-Attacus alciphron, Cramer, Pap. Exot. ii. p. 58, pl. 133, fig. E (1779).

Hypsa alciphron, Moore, Cat. Lep. E. I. Comp. ii. p. 292, n. 669 (1858—9).

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Noctua caricæ, Fabricius, Ent. Syst. ii. iii. p. 27 (1793); Donovan, Ins. New Holl. pl. 39, fig. 2 (1805).

Hipocrita vulgaris caricæ, Hübner, Samml. Exot. Schmett. 1, pl. 191, figs. 1—4 (1806).

Damalis caricæ, Hübner, Verz. bek. Schmett. p. 172, n. 1780 (1816).

Aganais caricæ, Boisduval, Voy. de l'Astrolabe, Lép. 1, p. 248 (1832—35).

Hypsa (*Damalis*) *caricæ*, Walker, Lep. Het. 2, p. 454, n. 13 (1854).

N. India (*James*), Moulmein (*Clerck*), Borneo (*Low*), Java (*Horsfield*), Ceram (*Wallace*), Celebes, Menado (*Madame Ida Pfeiffer*).

B.M.

19. Hypsa plaginota, n. sp.

Nearly allied to *H. alciphron*, but larger and paler, the nervures of primaries clearly defined in cream-colour; basal yellow area rather more extended; a large cream-coloured subcuneiform patch, its apex, within the cell, filling up the bases of the second median and lower discoidal interspaces; above it (at upper termination of discoidal cell) a small cream-coloured spot; below, with all the spots black and well defined, excepting two, near apical costa of secondaries; primaries with a broad creamy area, covering and surrounding the end of the discoidal cell; secondaries with the apical brown border badly defined; expanse of wings 2 inches 8 lines.

Hab.—India (*E. Doubleday*). Type, B.M.

Like many of the *Lepidoptera* presented by Doubleday, this is probably Indian. It appears to me to be quite distinct from the preceding species. Mr. Moore has a series of this species from the N. E. Himalayas; the white spots in the primaries of the male are rather smaller.

20. Hypsa producta, n. sp.

General pattern and colouration of *H. alciphron*, but larger, the primaries much more produced, the yellow area at base more extensive and oblique, with six instead of five black spots; spots on abdomen very large; primaries below with a whitish halo round the large disco-cellular black spot; spots of secondaries small but black; apical brown area confined to costa: expanse of wings 2 inches 11 lines.

Ceylon (*Templeton*). Type, B.M.

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Walker confounded this, the preceding and the succeeding species, with *H. alciphron;* the largest example of that insect in the collection measures 2 inches 9 lines in expanse, the length of the costa of primaries being 1 inch 2½ lines, and the inner margin 9½ lines; in *H. producta* the costa is 1 inch 3½ lines, and the inner margin 9½ lines; consequently the outer margin is far more oblique than usual. Also in Mr. Moore's collection.

21. Hypsa strigivenata, n. sp.

Allied to *H. alciphron,* but much larger, the veins of primaries well-defined, the costal area and a streak, tapering along the submedian nervure, cream-coloured; the postmedian creamy spot large, and sending spurs down the second and third median branches; basal area deep ochreous, with six small black spots; secondaries as in *H. alciphron,* but deeper coloured; body much deeper coloured; abdominal spots narrow and transverse; primaries below with a large white area from central discoidal spot to outer border; spots of secondaries as in *H. alciphron,* but small, black, and well-defined; apical brown area well-defined: expanse of wings 3 inches 1 line.

Penang (*Norris*). Type, B.M.

Mr. Moore has this species from Sikkim and Silhet.

22. Hypsa discreta.

Hypsa discreta, Walker, Lep. Het. Suppl. 1, p. 216 (1864).

N. Australia (*Elsey*). Type, B.M.

Subgenus LACIDES, *Walker* (Type, *L. ficus*).

23. Hypsa ficus.

Noctua ficus, Fabricius, Ent. Syst. iii. p. 27 (1793).

Damalis ficus, Hübner, Verz. bek. Schmett. p. 172, n. 1781 (1816).

Hypsa (*Lacides*) *ficus,* Walker, Lep. Het. 2, p. 456, n. 17 (1854).

N. Bengal (*Saunders*), N. India. (*Stevens*), Ceylon (*Templeton*). B.M.

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Subgenus AGANAIS (part), *Boisduval*, see p. 326.

24. Hypsa privata.
Hypsa privata, Walker, Journ. Linn. Soc. vi. p. 100 (1862).
Borneo (*Wallace*).

25. Hypsa æqualis.
Hypsa æqualis, Walker, Lep. Het. Suppl. 1, p. 214 (1864).
Aru (*Wallace*). Type, B.M.
This species may eventually prove to be the male of *H. significans*.

26. Hypsa australis.
Aganais australis, Boisduval, Voy. de l'Astrolabe, 1, Lép. p. 252, n. 5, pl. 5, fig. 3 (1832—35).
New Guinea.
Closely allied to *H. æqualis*.

27. Hypsa significans.
Hypsa significans, Walker, Lep. Het. Suppl. 1, p. 215 (1864).
Aru (*Wallace*). Type, B.M.

28. Hypsa strigosa.
Aganais strigosa, Boisduval, Voy. de l'Astrolabe, 1, Lép. p. 250, n. 2 (1832—35).
New Guinea.
Evidently allied to the preceding species.

29. Hypsa nebulosa, n. sp.
♂ Very close to *H. egens*, but with more slender and longer antennæ and longer primaries; altogether duller in colouring; primaries brownish-ochraceous, with the veins pale ochraceous; base, excepting on costa, bright ochreous; the five basal black spots wider apart and slightly larger; secondaries broader, dull ochreous, costal area sericeous-whitish; a small dusky spot on radial nervure: head, collar and thorax deep reddish-ochreous; a small black spot on each tegula; abdomen dull ochreous, with a dorsal series of black points: wings below duller and deeper in colouring, the brownish areas replaced by brown, crossed

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by pale nervures; all the black spots considerably enlarged; primaries with an additional black spot just below the base of first median branch; secondaries with two large subanal black spots, the upper one oblique: expanse of wings 2 inches 8 lines.

Saráwak (*Wallace*). Type, B.M.

A local representative of *H. egens*, but much deeper-coloured than males from N. India, our largest examples of which measure 2 inches 6 lines in expanse. Examples of the females sometimes attain to 1 inch 7 lines, but are brighter in colouring and less heavily spotted, whilst both sexes from Java are very small and brightly coloured, with the black spots of the under surface small.

30. Hypsa egens.

Hypsa (*Damalis*) *egens*, Walker, Lep. Het. 2, p. 453, n. 12 (1854).

N. India (*James*), Silhet (*Argent*), Moulmein (*Clerck*), Java (*Horsfield*).

Type, B.M.

Our smallest Javan example measures only 1 inch 10 lines in expanse. If it be proved by breeding that the Indian form is distinct, the name must be retained for the Javan insect, as Mr. Moore has figured the metamorphoses in his Catalogue (pl. xiii. figs. 7, 7ª), thus fixing it as the type of Walker's species.

31. Hypsa insularis.

Aganais insularis, Boisduval, Faune de Madag. p. 97, pl. 15, fig. 2 (1833).

Hypsa insularis, Walker, Lep. Het. 2, p. 459, n. 22 (1854).

Aganais borbonica ♀, Herrich-Schäffer, Lep. Exot. fig. 118 (1854), nec Boisduval.

Bourbon.

H. insularis is evidently closely allied to *H. egens*, but appears to differ on the under surface; it is not at all likely to be the female of *H. borbonica;* in my opinion, the latter is not even congeneric with *Hypsa*.

32. Hypsa versicolor.

Noctua versicolor, Fabricius, Ent. Syst. iii. 2, p. 49, n. 134 (1793); Donovan, Ins. New Holl. pl. 39, fig. 3 (1805).

Aganais versicolor, Boisduval, Voy. de l'Astrolabe, 1, Lép. p. 252, n. 6 (1832—35).

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Hypsa versicolor, Walker, Lep. Het. 2, p. 459, n. 26 (1854).
New Guinea.
This species seems to be also allied to *H. egens*.

Subgenus AGAPE, *Felder* (Type, *A. cyanopyga*).

33. Hypsa chloropyga.
Hypsa chloropyga, Walker, Lep. Het. 2, p. 455, n. 16 (1854).
Var. *Hypsa analis*, Walker, Lep. Het. 7, p. 1677 (1856).
Agape cyanopyga, Felder, Reise der Nov. Lep. 4, pl. cvi. fig. 4 (1874).
Port Macquarie (*Macgillivray*), Ceram (*Pfeiffer*). Types, B.M.

H. analis only differs from typical *H. chloropyga* in its rather smaller size and the smaller spots on primaries.

34. Hypsa Javana.
Phalæna Javana, Cramer, Pap. Exot. iii. p. 146, pl. 274, fig. C. (1782).
Hypsa (*Damalis*) *Javana*, Walker, Lep. Het. 2, p. 454, n. 14 (1854).
Moulmein (*Clerck*). B.M.

Hypsa saturata of Walker (Lep. Het. Suppl. 1, p. 217) appears to me to be the type of a new genus allied to *Petalia*, and I think that *Aganais ensemioides* of Felder (Nov. Voy. Lep. 4, pl. cvi. fig. 1) may be congeneric with it; the basal portion of the palpi in *H. saturata* is very hairy, the hairs being directed backwards in a point towards the upper part of the head; the terminal joint is wanting in the type; the antennæ are rather short, the wings more like *Petalia* than *Hypsa* in form, and the abdomen is slender; I shall therefore propose the name *Methypsa* for this insect.

Genus PANGLIMA, *Moore* (Type, *P. narcissus*.)

1. Panglima narcissus.
Phalæna-Bombyx narcissus, Cramer, Pap. Exot. 1, p. 116, pl. 73, figs. E, F (1779).
Noctua narcissus, Fabricius, Ent. Syst. ii. 3, p. 20 (1793).

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Hypsa narcissus, Walker, Lep. Het. 2, p. 458, n. 20 (1854).

China.

Mr. Moore has a series of this species from Madras.

2. Panglima gloriosa, n. sp.

Nearly allied to the preceding species, but the dark anterior area of primaries broader, and edged with sulphur-yellow; the veins not white; the border of secondaries black, interrupted by a large, subquadrate, apical, white patch, and continued round the margin to anal angle: expanse 3 inches.

Cabinda (*J. J. Monteiro*). Type, B.M.

The Liverpool Museum possesses a second example of this species from Old Calabar.

PACHYPHILONA, n. gen. (Type, *P. correcta*).

Allied to *Philona*, but not so slenderly built; the antennæ of the male short, and thickly pectinated; the outer margins of the wings regularly rounded; second and third median branches of secondaries not emitted so close together: abdomen more robust.

1. Pachyphilona correcta.

Hypsa correcta, Walker, Lep. Het. Suppl. 1, p. 217 (1864).

Ceylon (*Stevens*). Type, B.M.

Walker calls the secondaries of this species "pale luteous;" they are distinctly ochreous, as in *Philona*.

Mr. Moore fortunately possesses a male of this species; otherwise I could not have described the genus, as the type is destitute of antennæ.

Genus PHILONA, *Walker* (Type, *P. inops*).

1. Philona inops.

Hypsa (*Philona*) *inops*, Walker, Lep. Het. 2, p. 457, n. 18 (1854).

Philona inops, Moore, Cat. Lep. E. I. Comp. ii. p. 294, n. 676 (1858—9).

Silhet (*Sowerby, Stainsforth, Doubleday*); Java (*Horsfield*). Type, B.M.

The example from Java has white secondaries, but the

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yellow colouring in this group seems either to fade very rapidly, or to be frequently replaced by white; therefore I suspect it is merely variation.

Genus PETALIA, *Walker* (Type, *P. plagiata*).

1. Petalia plagiata.

Hypsa (*Petalia*) *plagiata*, Walker, Lep. Het. 2, p. 457, n. 19 (1854).

New Holland (*Stevens*); Moreton Bay (*Gibbon*). Type, B.M.

Genus AGANAIS, *Boisduval* (Type, *A. borbonica*).

In this genus the primaries are shorter, and the antennæ of the males much more broadly pectinated than in *Hypsa*.

1. Aganais subretracta.

Hypsa subretracta, Walker, Lep. Het. 7, p. 1676 (1856).

Aganais aphidas, Hopffer, Monatsber. Kongl. Akad. Wiss. Berl. p. 422 (1857); Peters' Reise n. Mozamb. p. 432, pl. 28, fig. 8 (1862).

Natal (*Gueinzius*). Type, B.M.

2. Aganais undulifera.

Hypsa undulifera, Walker, Lep. Het. 7, p. 1676 (1856).

Hab. —? (*Doubleday*). Type, B.M.

The secondaries are sometimes yellow; so that this species only differs from the preceding in having a brown outer border to the latter wings.

3. Aganais borbonica.

Aganais borbonica, Boisduval, Faune Ent. de Madag. p. 91, n. 1, pl. 15, fig. 1 (1833).

Aganais iodamia, Herrich-Schäffer, Lep. Exot. fig. 120 (1854).

Hypsa antica, Walker, Lep. Het. 7, p. 1673 (1856).

Hypsa stipata, Walker, Lep. Het. Suppl. 1, p. 216 (1864).

"Mauritius," *Boisduval*, "Cape," *Walker*, Hab. —? *Norris*. B.M.

We have the type of Walker's *H. stipata*; it differs in no respect from Boisduval's species.

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Genus ANAGNIA, *Walker* (Type, *A. subfascia*).

1. Anagnia subfascia.
Hypsa (*Anagnia*) *subfascia*, Walker, Lep. Het. 2, p. 446, n. 2 (1854).
Anagnia subfascia, Moore, Cat. Lep. E. I. Comp. ii. p. 296, n. 681 (1858—1859).
Moulmein (*Clerck*), N. India (*James*). Type, B.M.

Genus AGANOPIS, *Herrich-Schäffer*.

1. Aganopis orbicularis.
Hypsa (*Peridrome*) *orbicularis*, Walker, Lep. Het. 2, p. 445, n. 1 (1854).
Anagnia orbicularis, Moore, Cat. Lep. E. I. Comp. ii. p. 296, n. 682 (1858—1859).
Aganopis subquadrata, Herrich-Schäffer, Lep. Exot. Sp. Nov. p. 72, figs. 501—2 (1856).
N. India (*James*). Type, B.M.

Genus EUPLOCIA, *Hübner* (Type, *E. membliare*).

1. Euplocia membliaria.
Phalæna-Bombyx membliaria, Cramer, Pap. Exot. iii. p. 139, pl. cclxix. figs. C, D (1782).
Hypsa (*Euplocia*) *membliaria*, Walker, Lep. Het. 2, p. 448, n. 3 (1854).
Euplocia membliare (sic), Hübner, Verz. bek. Schmett, p. 172, n. 1782 (1816).
N. India (*Warwick*), Moulmein (*Clerck*). B.M.

2. Euplocia renigera.
Aganais renigera, Felder, Reise der Nov. Lep. 4, pl. cvi. fig. 2 (1874).
Hab. —?

3. Euplocia moderata, n. sp.
Euplocia membliaria, Moore (nec Cramer), Cat. Lep. E. I. Comp. ii. p. 295, n. 679 (1858-9).
Very like *E. membliaria*, but smaller and darker; the male costal fold much less developed; the body much deeper in colour; the orange discoidal patch darker and the orange-spot at the end of the cell obsolete, merely colouring the discocellulars: expanse of wings 2 inches 10 lines to 3 inches.
♂, ♀ Java (*Horsfield*). Type, B.M.

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4. Euplocia inconspicua, n. sp.

Nearly allied to *E. membliaria*, but darker, the white veins restricted to the external area of primaries, obsolete on secondaries; the male costal development scarcely traceable; the orange patch of female restricted to a basi-costal streak; no trace of orange at end of cell: body deep orange: expanse of wings 3 inches to 3 and 1 line.

Fifty miles from Macassar (*Wallace*). Type, B. M.

Genus NEOCHERA, *Hübner* (Type, *N. eugenia*).

1. Neochera eugenia.

Phalæna eugenia, Cramer, Pap. Exot. iv. p. 235, pl. cccxcviii. fig. M (1782).

Neochera eugenia, Hübner, Verz. bek. Schmett. p. 173, n. 1783 (1816).

Hypsa (*Neochera*) *eugenia*, Walker, Lep. Het. 2, p. 449, n. 5 (1854).

Dorey (*Wallace*). B.M.

Var. smaller, with the white veins extending all over the primaries, instead of being restricted to basal area.

Aru (*Wallace*). B.M.

2. Neochera Bhawana.

♂ *Neochera Bhawana*, Moore, Cat. Lep. Mus. E. I. Comp. ii. p. 295, n. 678, pl. vii[a]. fig. 4 (1858, 1859).

♀ *Neochera dominia* (part), Moore, Cat. Lep. Mus. E. I. Comp. ii. p. 295, n. 677 (1858—1859).

♂, ♀ Java (*Horsfield*). Type, B.M.

Mr. Moore speaks of male and female Javan *N. dominia* as in Horsfield's collection, but I have examined all the specimens minutely, and find that all the examples referred to *N. dominia* are females; they differ from the females of *N. marmorea*, &c. in having the spots of secondaries united into a continuous marginal border.

3. Neochera albivena.

Hypsa albivena, Walker, Lep. Het. Suppl. 1, p. 213 (1864).

Tondano. Type, Coll. Hope, Oxford.

I strongly suspect that this is identical with the Aru form of *N. eugenia*.

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4. Neochera stibostethia, n. sp.

♀ Very like the female of *N. Bhawana*, but rather paler, with the head, collar, thorax, tegulæ and basal segment of abdomen white; the collar and tegulæ partially bordered with ochreous: expanse of wings 3 inches 1 line.

Bourou (*Wallace*). Type, B. M.

This species has the continuous border of the preceding females.

5. Neochera marmorea.

♂ *Hypsa marmorea*, Walker, Lep. Het. 7, p. 1674 (1856).

♂, ♀ *Hypsa* (*Neochera*) *dominia*, Walker, Lep. Het. 2, p. 448, n. 4 (1854).

♂ Silhet (*Stainsforth*), ♀ N. India (*James*), Moulmein (*Clerch*). Type, B. M.

Walker made the same example serve as male both for *N. dominia* and *N. marmorea*.

6. Neochera dominia.

♀ *Phalæna dominia*, Cramer, Pap. Exot. iii. p. 123, pl. 263, figs. A, B. (1782).

Neochera dominia, Hübner, Verz. bek. Schmett. p. 173, n. 1784 (1816).

Coimbatoor, S. India (*Walhouse*). B. M.

7. Neochera? isthmia.

Hypsa isthmia, Walker, Lep. Het. vii. p. 1674 (1856).

Manilla. Type, Coll. Hope, Oxford.

This may not be a *Neochera*.

Phalæna mauritia of Cramer and *Lithosia Arthus-Bertrand* of Guérin, referred to *Hypsa* by Walker, are both species of *Amerila*.

ADDITIONAL SPECIES.

Hypsa sphærifera.

Hypsa borbonica ♂, Herrich-Schäffer, Lep. Exot. fig. 119 (nec fig. 118), (1854).

Australia.

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XXI. *On some new genera and species of Heteromerous* Coleoptera (Helopidæ) *from Tierra del Fuego.*

By Chas. O. Waterhouse.

[Read 3rd November, 1875.]

Most of the insects described in this paper were brought to this country by Mr. Charles Darwin. They were described by my father, many years ago, in a paper on the classification of the *Heteromera*. By a most unfortunate accident this paper slipped, during its transport to the Entomological Society, from the wrapper in which it was enclosed, and was lost.

The specimens have remained untouched until the present day, and in the following descriptions I have made use of the original dissections made by my father.

The species are five in number, and, although they all approach the genus *Helops*, they differ so much in structure and appearance that I have deemed it best to propose three new genera for their reception.

They are all apterous, and one of them was found in some numbers in Tierra del Fuego, on the sea-shore, under stones that were covered to some depth at each high tide.

The following are the descriptions:—

Fam. HELOPIDÆ.

Chitoniscus, G. R. Waterhouse, MS.

Mentum very small. Ligula truncate in front, with the angles rounded. Apical joint of the labial palpi subcylindrical, small, nearly as long as the two preceding joints taken together. Maxillary palpi with the penultimate joint not longer than broad; the apical joint twice as long as the second, wider at its apex, but not securiform. Mandibles bifid at the apex. Labrum transverse, not emarginate. Head not much narrowed behind the eyes; clypeus distinctly separated from the forehead by a

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deeply-impressed line. Scarcely any ridge over the base of the antennæ. Eyes not very prominent. Antennæ moderately long; the second joint cylindrical, a little longer than the first and more slender; the third, fifth and seventh joints nearly equal, a little shorter than the second; the fourth, sixth and eighth joints a little shorter than the third, fifth and seventh respectively; the ninth, tenth and eleventh gradually becoming a little stouter. Thorax flattened, all the angles rounded; base emarginate. Scutellum transverse, truncate at the apex. Elytra imperfectly covering the abdomen, diverging posteriorly. Legs long; anterior tarsi with the four basal joints (very gradually decreasing) subequal; basal joint to the posterior tarsus as long as the two following together. Anterior coxæ prominent, the prosternum sunk between them and channelled; intermediate coxæ somewhat widely separated from each other; the mesosternum truncate in front, transversely excavated between the coxæ; metasternum very short, with a deep central impression; posterior coxæ rather widely separated. Teguments generally soft.

Chitoniscus brevipennis, sp. n.

Piceus, depressus; corpore subtus, femoribusque piceo-testaceis. Capite sat lato, nitido, irregulariter haud crebre punctulato, clypeo piceo-testaceo. Antennis piceis, articulo primo et 9°, 10° et 11° piceo-testaceis, his pubescentibus. Thorace dorsim depressiusculo, nitido, sat crebre subtiliter punctato, longitudine vix latiori, lateribus rotundatis. Scutello piceo-testaceo, subtiliter punctulato. Elytris basi thorace paulo latioribus postice ampliatis, striatis; singulo elytro margine interno arcuato. Abdomine supra nitido, impunctato, subtus subtiliter aciculato-punctato, punctis setiferis. Pectore nitido, impunctato.

Long. $4\frac{1}{4}$ lin.; lat. $1\frac{1}{2}$—2 lin.

Hab.—Tierra del Fuego. Brit. Mus.

The surface of the elytra is slightly wrinkled, and the striæ (not deeply impressed) are in pairs and not punctured.

This most curious insect (which from the loose manner in which the joints are set reminds one of a *Blatta*) was found in some numbers by Mr. Darwin on the sea-shore under stones.

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HYDROMEDION, gen. nov.

Antennæ long and slender, the third to tenth joints gradually becoming shorter, the tenth being still one-third longer than broad. Elytra covering the abdomen, not diverging at the apex, the internal margins being contiguous nearly to the apex. Prosternum sunk between the coxæ, keeled. Mesosternum completely shelving in front, compressed between the coxæ, which are not much separated. Metasternum short, channelled behind; posterior coxæ not much separated.

The rest as in *Chitoniscus*.

Hydromedion elongatum, sp. n.

Elongatum, piceo-testaceum, sat nitidum. Capite sat magno, sat crebre subtiliter punctulato. Thorace capite paulo latiori, longitudine vix latiori, sat crebre fortius punctato, leviter convexo, antice omnino rotundato, postice paulo angustato, angulis posticis [plerumque] fere rectis, obtusiusculis. Scutello transverso, basi parce punctulato. Elytris basi thorace paulo latioribus, et $2\frac{3}{4}$ longioribus, postice ampliatis, sat convexis, fortiter punctato-striatis, interstitiis sat angustatis, leviter convexis, nitidis; singulo elytro ad apicem rotundato. Abdomine subtus parce subtilissime punctulato.

Long. 5 lin.; lat. 2 lin.

Var.—Head more distinctly punctured. Thorax with the sides much rounded, and the posterior angles more obtuse. Mesosternum only slightly keeled between the coxæ; striæ of the elytra less closely punctured.

Hab.—Tierra del Fuego. Brit. Mus.

PARAHELOPS, gen. nov.

Eyes prominent. Antennæ reaching to the shoulders of the elytra: first joint stout, a little longer than broad; second joint the same length as the first but less stout; third joint as long as the two preceding taken together, cylindrical; the fourth scarcely longer than the second; the fifth to tenth gradually becoming shorter, but not perceptibly thicker; the eleventh joint nearly globular, but with a fine point at the apex. Elytra covering the abdomen, the internal margins contiguous, the internal angle slightly rounded. Prosternum flat between the coxæ (which are not very prominent), not produced behind. Mesosternum completely shelving in front, the

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part between the coxæ moderately broad and nearly flat. Abdominal process between the coxæ moderately broad, truncate in front. The rest as in *Chitoniscus*.

The structure of the sterna in this genus most nearly approaches that of *Helops striatus*, but the mesosternum is shelving in front and not concave. The apical joint of the maxillary palpi is not securiform, &c.

Parahelops pubescens, sp. nov.

Elongatus, picco-niger, nitidus, parce breviter griseo-pubescens. Capite crebre distincte punctato; oculis prominentibus. Thorace [plerumque] convexiusculo, sat crebre distincte punctato, capite paulo latiori, latitudine haud longiori, antice posticeque paulo angustatis, lateribus leviter arcuatis, ante angulis (anticis posticisque) leviter incisis. Scutello triangulari, brevi. Elytris basi thorace paululo latioribus, medio paulo ampliatis, convexis, sat fortiter striato-punctatis; interstitiis haud convexis, subseriatim subtiliter punctulatis. Corpore subtus crebre distincte punctato.

Long. 3⅓ lin.; lat. 1⅓ lin.

This species varies in a most remarkable manner both in sculpture and form. The thorax is thickly punctured, sometimes moderately strongly, sometimes very delicately; it is sometimes broadest in front, gradually narrowed behind, the sides being nearly straight; sometimes the sides are much rounded, and the thorax is so narrow in front that only the neck of the head can be withdrawn, whereas in other examples the head and eyes can be withdrawn into the thorax; the posterior angles are at times slightly acute, sometimes obliquely truncate. The elytra vary in length, sometimes bluntly rounded at the apex, at others somewhat attenuated; the striæ are sometimes impressed and strongly punctured, at others not impressed and delicately punctured. These differences are certainly not specific, as the two sides of the same specimen are not always quite alike.

Hab.—Tierra del Fuego. Brit. Mus.

Parahelops Darwinii, sp. nov.

Nigro-piceus, nitidus, sat latus, depressiusculus. Capite crebre fortiter punctato; oculis prominentibus; antennis piceis. Thorace capite duplo latiori, longitudine ⅓ latiori, convexiusculo, crebre fortiter punctato, antice omnino ro-

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tundato, postice angustato, lateribus rotundatis, angulis posticis fere rotundatis. Scutello transverso, brevi. Elytris thorace paululo latioribus, postice paulo ampliatis, leviter convexis, ad suturam depressiusculis, fortiter striato-punctatis, interstitiis parce subtiliter punctulatis. Pectore discrete fortiter punctato. Abdomine subtiliter discrete punctulato. Tarsis obscure testaceis.

Long. 4½ lin.; lat. 2 lin.

Var.—Thorax with the sides very gently emarginate towards the posterior angles, which are in consequence more distinct.

Hab.—Tierra del Fuego; Valparaiso. Brit. Mus.

Parahelops quadricollis, sp. n.

Oblongus, piceo-niger, sat convexus, nitidus, breviter griseo-pubescens. Capite creberrime distincte punctato; oculis prominulis. Thorace parum convexo, creberrime distincte punctato, capite ⅓ latiori, longitudine ⅓ latiori, margine antico medio parum producto, angulis anticis rotundatis, lateribus fere parallelis, ante angulos posticos subito parum obliquis, angulis posticis obtusiusculis. Scutello parvo, triangulari. Elytris thorace paulo latioribus, et 2½ longioribus, sat convexis, postice paululo ampliatis, sat fortiter punctato-striatis, interstitiis convexiusculis, subseriatim subtilissime punctulatis. Abdomine crebre distincte punctato.

Long. 3¼ lin.; lat. 1½ lin.

This species most nearly approaches *C. pubescens*, and has the same general structure, but it is relatively broader. It is distinguished by its thicker punctuation of the head and thorax, and by the broad form of the latter. The elytra are proportionately less elongate, the shoulders are distinct. The abdomen is less strongly and less thickly punctured than in *C. pubescens*, and the pubescence is finer. The apex of the antennæ and the tarsi are pitchy.

Var.—Thorax with the sides gently rounded.

Hab.—Falkland Islands (C. Darwin and Thos. Havers, Esqrs.) Brit. Mus.

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To complete this paper I subjoin the following species, collected by Dr. Hooker and Mr. T. Havers:—

Hydromedion elongatum, var.

In the British Museum there are three specimens which differ from the species which I have named *H. elongatum* in being rather smaller, testaceous, relatively shorter, and having the elytra less strongly punctured, the striæ not impressed. These may prove to belong to a distinct species, but I prefer at present considering them a variety of the above named.

Hab.—Straits of Magellan (Dr. Hooker).

Hydromedion variegatum, sp. nov.

Precedenti affine; minus convexum, testaceum, fusco-variegatum, antennis tibiisque fusco-annulatis. Capite post oculos rotundato-angustato. Elytris sat fortiter subseriatim punctatis, marginibus reflexis.

Long. 3¾—4¼ lin.

I am chiefly induced to give this the rank of a species on account of the form of the head. In *H. elongatum* the head behind the eyes has the sides parallel, so that the eyes do not project; in the present insect the head is contracted behind the eyes so as to leave them prominent. The thorax is less convex, and has the lateral margins distinct. The elytra are relatively shorter, less convex, not strongly punctured, and the margins are gently reflexed. The apical half of each joint of the antennæ and tarsi is fuscous, and the tibiæ are ringed with the same colour.

Hab.—Straits of Magellan (Dr. Hooker and Capt. Ross). Brit. Mus.

Parahelops Haversii, sp. n.

Ovalis, brunneo-testaceus, nitidus, convexiusculus. Capite creberrime subtiliter punctulato; oculis prominentibus. Thorace capite duplo latiori, longitudine ¼ latiori, leviter convexo, creberrime distincte punctulato, antice posticeque fere recte truncato, angulis rotundatis, lateribus leviter rotundatis, marginibus reflexis. Scutello transverso, crebre punctulato. Elytris thorace paulo

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latioribus, medio leviter ampliatis, convexis, fortiter punctato-striatis, interstitiis convexiusculis, levibus ; marginibus lateralibus bene reflexis. Corpore subtus subopaco; abdomine creberrime subtiliter punctulato, flavopubescenti.

Long. 3 lin.; lat. $1\frac{2}{3}$ lin.

In general form this species resembles a *Necrophilus* (*Silphidæ*), but has the thorax scarcely broader behind than in front. The eyes are very prominent. The shoulders of the elytra are nearly rectangular, but blunt; the striæ are not deeply impressed, are strongly but not very thickly punctured; the margins are reflexed, the reflexed portion gradually narrowing to the apex.

Hab.—Falkland Islands (T. Havers, Esq.). Brit. Mus.

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XXII. *Description of a new genus of* Coleoptera, *belonging to the family* Scaritidæ. By Dr. Hermann Burmeister.

[Read 1st December, 1875.]

The following description of a new Coleopterous insect was communicated by Professor Burmeister, of Buenos Ayres, who had named it in honour of Professor Westwood on his attaining the age of seventy years, on the 22nd December, 1875 (adopting for it one of his christian names):—

Obadius insignis.

This new genus, belonging to the family *Scaritidæ*, was taken on the shore of the River Uruguay, near the little town of Concordia in Entrerios; and communicated to me as the single specimen found there. The insect has the external appearance of *Clivina*, but differs from that genus and all others known of the same family by many particular characters, exposed in the following general description:—

Adumbratio generis.

Antennæ ante oculos insertæ, breves, 11-articulatæ, submoniliformes; articulo primo elongato, subclavato, sequentibus tribus longitudine æquali; secundo, tertio et quarto longitudine decrescentibus, nudis, nitidis; quarto omnium minutissimo; reliquis longitudine æqualibus, sensim paululum crassioribus, tenerrime pubescentibus, pallide pilosis; ultimo majori, obtuse acuminato.

Oculi hemisphærici, parum convexi, sed desuper conspicui, posticum versus nodulo genarum suffulti.

Clypeus, *frons* et *vertex* irregulariter rugosi, lateribus argute marginatis; pars anterior frontis juxta clypeum dilatata, subtumida, sulco longitudinali a clypeo separata, superficie inæquali, antice oblique carinata.

Labrum breve, arcuatum, transversum, angulis rotundatis.

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Mandibulæ sat longæ, falcatæ, acutæ, edentatæ, supra cum area basali paululum elevata, quibus areis anguli labri incumbent in statu clauso mandibularum; clausæ labrum circumdant figura semicirculari, sinistra super dextram inferiorem eamque obtegente; utraque supra plana, subtus convexa, basi carinata.

Maxillæ absconditæ, vix examinatæ, palpis longis, quadri-articulatis; articulo secundo cylindrico, parum curvato; tertio minuto; ultimo ovali, basi introrsum versus incrassata, summo apice parum truncato sed acuminato.

Mentum transversum, parum dilatatum, carina media transversa bipartitum, parte basali bifoveolata; lobis lateralibus subacutis, parum apice prominentibus, denteque medio simplici acuto, angulis lateralibus longitudine æquali.

Ligula brevis, obtusa; palpis labialibus quadriarticulatis, sat longis; articulo primo cylindrico; secundo minutissimo; tertio longiori, subcylindrico, ultimo parum breviori; hoc ovato, basi incrassato, acuminato, sed summo apice vix acuto, obtusiusculo.

Prothorax sat longus, latitudine paulo longior, anticum versus angustior, basi arcuata, angulis posticis oblique rotundatis, obtusis; superficie dorsali sulco antico profundo transverso post marginem in medio angulato et bidentato, altero longitudinali tenuiori, striisque multis (ultra triginta) tenuibus transversis, totum discum pronoti occupantibus; lateribus pronoti lævibus, parum rugulosis, sulco marginali bene distincto ab ipso margine separatis; summa basi pulvinata, foveolis duabus oblongis impressa.

Scutellum absconditum.

Elytra oblonga, subcylindrica, lateribus parallelis, in apice rotundata, pronoto duplo longitudine æqualia, profunde striata; striis punctatis, interstitiis parum convexis.

Pectora et *abdomen* convexa, nitida, impunctata; prosterno tumido, mucrone obtuso subtriangulari inter coxas producto, lobis pronoti interioribus tenuiter rugulosis; parapleuris sulco circumdatis; abdomine quadriannulato, segmentis convexiusculis, ante marginem tenuiter transverse sulcatis.

Pedes breves, sat validi; coxis quatuor anterioribus globosis, prominulis; femoribus anticis incrassatis; tibiis his palmatis, extus obtuse tridentatis, apice in dentem longum angustum curvatum producţis, in latere interno

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profunde excisis, calcaribus duobus æqualibus, longis, aduncis, subtusque carina argute munitis. Tarsis anterioribus elongatis, articulo primo reliquis unitis æquali, his sensim decrescentibus, omnibus utrinque setosis. Unguibus minutis. Femoribus mediis et posticis haud incrassatis, his parum brevioribus, illis subaduncis; tibiarum angulis externis crenatis, setosis; mediis parum brevioribus, dente apicali externo armatis; posticis gracilioribus, longius setosis; omnibus intus in apice bicalcaratis, calcaribus inæqualibus. Tarsis quatuor posticis tibia longioribus, articulis decrescentibus, ultimo præcedente parum longiori, omnibus setosis.

Speciem unicam mihi notam, semel captam propango nomine

O. insignis.

Piceo-niger, nitidus; antennis, palpis pedibusque obscure ferrugineis. Long. 5 lin. (9 mm.).

Habitat in littore fluminis Uruguay, circa oppidum La Concordia. Dom. A. Doering.

Caput elongatum, oblongo-ovale, anticum versus paulo latius; clypeo truncato, lateribus elevatis, ovalibus, argute marginatis, supra antennarum insertionem protractis, mandibularum basi adæquantibus. Superficies tota rugulosa, sed impunctata. Pronoti disco transversim multi-striato, striis in latere externo abbreviatis; lateribus descendentibus, obsolete rugulosis; antice sulco profundo post marginem impresso, in medio angulato, angulo bidentato; margine laterali parum elevato, stria intermarginali a disco separato; angulis anticis rotundatis, parum prominulis; posticis obliquis; sulculo oblongo utrinque, discum separante, juxta conjuncturam impresso, lineaque media longitudinali parum profunda. Elytra obtuse marginata, juxta marginem sulco longitudinali excavata, striisque duabus angustis in ipso sulco notata; disco sexies striato, striis catenato-punctatis, interstitiis parum convexis, externo juxta sulcum perperam elevatiori; margine inflexo laterali stria intramarginali altera signato; striis discalibus in apice binis conjunctis, hoc modo 1 & 2, 3 & 4, 5 & 6, tuberculo tumido terminali separatis. Corpus subtus impunctatum, glaberrimum, lateribus pronoti inflexis, latis, transverse parum rugulosis; gula ante mentum foveola duplici impressa, dehinc longitudinaliter stria unica sulcata.

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The genus belongs, according to the arrangement of M. Putzeys, repeated by Lacordaire (Genr. d. Coleopt., i., 190), to the section with arcuate and acuminate mandibles, and takes its place alongside of the two genera *Lachenus* and *Cryptomma*, uniting in some respects the peculiar configuration of both. But from these two genera *Obadius* is especially distinguished by the form of the mentum with its three equal acute apical teeth, and also from *Cryptomma* by the prominent eyes. The fine transverse striation of the pronotum, which, as far as I know, is unique in the whole family of *Scaritidæ*, seems to be a very singular character of this insect.

The accompanying figure shows this fine striation and also the peculiar configuration of the head; indicating the lateral production near the clypeus, and the mandibles crossing, one over the other, when closed. All the other organs are less remarkable, resembling those of *Clivina* and other genera of the family, and therefore I have not thought it necessary to figure them.

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PROCEEDINGS

OF THE

ENTOMOLOGICAL SOCIETY OF LONDON

FOR

1875.

February 1, 1875.

Sir SIDNEY SMITH SAUNDERS, C.M.G., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Thesaurus Entomologicus Oxoniensis,' part ii.; presented by the Author, J. O. Westwood, Esq., M.A., F.L.S., &c. 'Pinacographia,' illustrations of more than 1000 species of North-West European Ichneumonidæ sensu Linnæano; by the Author, M. S. C. Snellen van Vollenhoven. 'Annales de la Société Linnéene de Lyon,' année 1873; by the Society. 'Bulletin de la Société Impériale des Naturalistes de Moscou,' 1874, no. 2; by the Society. 'L'Abeille,' 1874, livr. 24; 1875, livr. 1; by the Editor. 'Exotic Butterflies,' part 93; by the Author, W. C. Hewitson, Esq. 'The Entomologist's Monthly Magazine' for February; by the Editors. 'Newman's Entomologist' and 'The Zoologist' for February; by the Editor. 'The Canadian Entomologist,' vi., no. 11; by the Editor.

Election of Members.

Clermont Livingstone, Esq., of Tudor Lodge, Snaresbrook, was balloted for and elected an Ordinary Member; and M. Auguste Sallé, of Paris, a Foreign Member.

Exhibitions, &c.

Mr. S. Stevens exhibited a dark variety of Noctua glareosa, *Gn.*, and Mr. Champion exhibited specimens of Amara continua, *Thoms.*, taken at Caterham and Mickleham.

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Mr. Druce exhibited a selection from a fine collection of Diurnal Lepidoptera from Santarem, Brazil.

The President exhibited a nest of Polistes gallicus, taken on the Esplanade at Corfu, of which the cells were partly constructed with coloured paper taken from some play-bills posted in the vicinity, as alluded to in his Anniversary Address, delivered at the last meeting.

Mr. F. Smith remarked that specimens of Colletes cunicularia, *Linn.* (C. hirta, *St. Fargeau*) had been captured hitherto only in the Isle of Wight and near Liverpool, and that a number of specimens having been forwarded to him from the latter place, he had transported them to a suitable locality at Shirley Common in 1873, and that he had reason to believe that he had succeeded in establishing a colony there, as the insect had been taken near the same spot in 1874 by Mr. d'Arcy Power.

Papers read, &c.

A paper was communicated by Mr. A. G. Butler on the Rhopalocera of Australia.

A paper was read by Mr. W. Arnold Lewis, entitled "On Entomological Nomenclature and the Rule of Priority.

The President nominated Messrs. Dunning, Pascoe and Jenner Weir as Vice-Presidents for the ensuing year.

February 15, 1875.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Proceedings of the Royal Society,' no. 157; presented by the Society. 'L'Abeille,' tome xi., livr. 2; by the Editor.

Election of Member.

Frederick Henry Ward, Esq., of Springfield, Tooting, was balloted for and elected an Ordinary Member.

Exhibitions, &c.

Mr. Phipson exhibited a singular variety of Strenia clathrata from Basingstoke, the wings being nearly unicolorous (fuscous), with a few pale spots.

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Mr. F. Smith exhibited an additional collection of Hymenoptera sent from Calcutta by Mr. Rothney. It consisted of 1573 specimens of Fossorial Hymenoptera and Apidæ, all in beautiful condition. There were probably not more than twenty-five undescribed species; but from twenty to thirty species, which were hitherto represented in the British Museum by a single sex, were here most fully represented.

Mr. Verrall exhibited a number of living fleas taken two days previously from inside the ears of a rabbit near Lewes. They were gregarious in this situation, and in such a position that the animal was unable to dislodge them by scratching. He alluded to a communication made to him by Mr. M'Lachlan regarding a species from Ceylon which was gregariously collected in a very limited space on the neck of a fowl, and which had been exhibited at a recent meeting of the Royal Microscopical Society. They were fixed to the skin of the fowl by the proboscis, so that only the tails were visible outwards. Mr. Cole said he had found fleas on a hedgehog; and Mr. W. A. Lewis had obtained a species on a marmot in Switzerland.

Mr. Dunning called attention to the following extract from a recent French paper:—

Colouring Matter from the Cockchaffer.—The 'Bulletin des Sciences et Arts' of Poligny (Jura) gives particulars of a curious discovery by Dr. Auguste Chevreuse. He had found that in decapitating living cockchaffers an hour after they have been feeding, they yield four or five drops of a colouring substance, which varies with the nature of the leaves on which they have been feeding, and he has already obtained fourteen different shades. M. Nichlès, Professor of Chemistry, M. Préclaire, Professor of Drawing, and M. Chatelain, architect, have found that this substance may be employed either in mono-tinted drawings—like Indian ink, sepia, &c.—or mixed with water colours, and that it does not change on exposure to the light. The colouring substance may be collected on glass or in shells, in which it may be left to dry, and when required for use it is sufficient to dissolve it in water. When applied in a thick coat it presents the effect of varnish. Two or three cockchaffers suffice for a small water-colour drawing.

The Rev. R. P. Murray stated that Mr. Edwards, of Virginia, was desirous of obtaining specimens of the pupæ of Pieris Napi, and that he would be happy to receive them for him from any entomologist who might be able to obtain them.

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March 1, 1875.

Sir SIDNEY SMITH SAUNDERS, C.M.G., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Beiträge zur näheren Kenntniss der in dem Baikal-see vorkommenden mederen Krebse aus der Gruppe der Grammariden,' von Dr. B. N. Dybowski; 'Horæ Societatis Entomologicæ Rossicæ,' t. x., nos. 1—4; presented by the Society. 'Tijdschrift voor Entomologie, nitgegeven door de Nederlandsche Entomologische Verein,' t. xvii., nos. 1—6; by the Society. 'The Canadian Entomologist,' vol. vi., no. 12; by the Editor. 'The Entomologist's Monthly Magazine' for March; by the Editors. 'Newman's Entomologist' and 'The Zoologist' for March; by the Editor. 'List of the Lepidoptera recorded as having been found in New Zealand previous to the year 1871,' by R. W. Fereday, C.M.E.S.L.; 'List of the Insects recorded as having been found in New Zealand previous to the year 1870,' by Capt. F. W. Hutton, C.M.Z.S.; by R. W. Fereday, Esq.

Election of Member.

W. D. Robinson-Douglas, Esq., of Orchardton, Castle Douglas, a Subscriber to the Society, was balloted for and elected an Ordinary Member.

Exhibitions, &c.

Mr. F. H. Ward exhibited some living specimens of a Lepisma allied to L. saccharina, which he believed to be a new species in this country, and which was found in a bakehouse near London, in the brickwork of the oven and other warm places about the buildings. Mr. M'Lachlan suggested that it might have been introduced in some American flour, as Mr. Packard had recently published an account of a species which was found in America, closely allied to L. saccharina, and which he suspected might prove identical with the present species.

Mr. Ward also exhibited some microscopic slides showing specimens of the Chigoe, male and female, and portions of human skin with the insect attached.

Mr. Champion exhibited larvæ of Empusa pauperata, sent by Mr. Walker from Corfu.

A note was received from Mr. W. C. Boyd, with reference to some fleas exhibited at the last meeting. He stated that fleas were frequently found on the *inside* of the ears of wild rabbits, especially about this time of year, and that his brother had seen a rabbit which must have had three hundred

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fleas in the two ears, and that they looked as if smeared inside with black paint. He believed the rabbits were not much troubled by the presence of the parasites, as he had never noticed any inflammation, however many fleas there might have been. He also found that hedgehogs usually swarmed with fleas. Mr. Gorham said he had received fleas from a friend who had found them on mice.

Mr. Dunning directed attention to an interesting paper by Dr. Leconte on Entomological Nomenclature and Generic Types, which appeared in the December part of the 'Canadian Entomologist.'

Paper read.

The Rev. H. S. Gorham communicated a paper containing descriptions of eighteen new species of Endomycici from various tropical countries.

March 15, 1875.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Donations to the Library.

The following donations were announced and thanks voted to the donors:—'Proceedings of the Royal Society,' vol. xxiii., no. 159; presented by the Society. 'Annales de la Société Entomologique de Belgique,' tome xvii., fasc. 2; by the Society. 'Stettiner Entomologische Zeitung,' 1875, nos. 1—3; by the Society. 'The Canadian Entomologist,' vol. vii., no. 1; by the Editor. 'Entomologische Nachrichten,' nos. 1—4; by the Editor. 'L'Abeille,' 1875, 3e livr.; by the Editor. 'L'ennemi de la Pomme-de-terre: Notice sur le Doryphora decemlineata,' par Oswald de Kerchove de Denterghem; by the Author.

By purchase:—Boisduval, Dr. J. A., 'Species général des Lepidoptères Heterocères: tome 1re, Sphingides, Sesiides, Castnides;' and Atlas of eleven plates.

Exhibitions, &c.

Mr. Sealy, who had recently arrived from India, exhibited some fine examples of a species of Ornithoptera, bred from larvæ taken in Malaba feeding on Aristolochia indica.

Prof. Westwood exhibited drawings of several undescribed Coleopter remarkable forms, of which it was his intention to forward descriptions t Society. Amongst them was an insect from the collection of M. [illegible] which bore a strong resemblance to a Rhysodes, and wh Rhysodina Mniszechii, but which was really a Heteron

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Mr. M'Lachlan remarked that the species of Lepisma exhibited at the last meeting by Mr. F. H. Ward, did not, on examination, correspond, as he expected, with the description of L. domestica, a common species in the United States, nor did it coincide exactly with the descriptions of any of the other described species, so far as he had been able to compare them.

Prof. Westwood said he had seen British examples of Lipura corticina, *Bourlet*, on apple trees, though the insect was not included as British in Sir John Lubbock's Monograph.

Mr. C. O. Waterhouse exhibited a living specimen of Monohammus Heros bred in England from foreign timber.

Dr. Sharp forwarded the following correction of an error in the third paper in the 'Transactions' for 1873:—

"Herr Wehncke, of Harburg, has called my attention to an error I have committed in a paper on the water-beetles of Japan, published by the Society in the first part of its 'Transactions' for 1873. The species described there by me under the name of Hydaticus japonicus (p. 48) is undoubtedly the Hydaticus Adamsi, *Clark*, while the species alluded to by me, in the same paper, as Hydaticus Adamsi, is the Hydaticus Bowringii, *Clark*. The error was occasioned by an unfortunate transference of name in a letter Mr. Lewis wrote to me after making an examination of Clark's types."

Mr. Butler read the following review of Boisduval's recently-published volume of the Suites à Buffon (Lepidoptères), containing the Sphingidæ (including Zygæna, &c.):—

"Dr. Boisduval's long-expected work on the Sphingidæ has at length appeared: it is illustrated by eleven excellent coloured plates; and if these had been published without the letterpress, Lepidopterists would have had cause to be grateful to the author; as it is, the work of this veteran entomologist contains so many errors and omissions, that it only obscures the subject which it should have assisted in illuminating. Not only has Dr. Boisduval, in the 380 pages devoted to this magnificent group, apparently taken no pains to ascertain what has been done by other workers during the last nineteen years (entirely overlooking even the Supplement to Mr. Walker's Catalogue), but he has returned to the errors of Fabricius and his contemporaries, in his disregard of the law of priority: he calmly renames well-characterized genera and species, quoting the universally accepted names as synonyms, and gives no reason whatever for so doing; he constantly gives to his own MS. names preference to the descriptions of others; he quotes Catalogue lists of undescribed species, thus conveying to the mind of the unwary student the impression that his species have long been characterized; and in addition to all this he hopelessly confounds together subfamilies and genera whose larvæ are utterly distinct. In proof of the recent publication of this work (dated 1874) I feel compelled to subjoin an extract from a letter which I recently received from

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the author, dated 18 Fevrier, 1875:—'Le species des Sphingides, Sesiides et Castniides sera mis au vente Lundi prochain chez M. Roret editeur, Rue Hautefeuille à Paris.'"

The Rev. R. P. Murray communicated the following remarks:—

"The species of Terias forming the Hecabe group have long been a source of perplexity to me, and for some time I have entertained a suspicion that most of them were referable to but one species, T. Hecabe, *Linn.* I think I am now able to bring forward proof that T. Æsiope, *Mén.*, at least, is only a form of Hecabe, and some evidence that the same is probably the case with T. Brenda, *Doubl., Hew.*, and T. Sari, *Horsf.* I have frequently received from Mr. Miskin, of Brisbane, specimens of typical T. Hecabe from Rockhampton, and also others of T. Æsiope from Brisbane, these forms being common in their respective localities, while it is by no means common to find them intermixed. So far the only evidence in favour of their forming but one species was afforded by the large number of specimens intermediate in character which came from Rockhampton. But I now learn, by letters received from Mr. Miskin, that he has succeeded in breeding both forms from larvæ found on the same plant (*Indigofera*, sp.), and that he is now convinced that both forms belong to the same species. The curious distribution of the forms would tend to prove that the difference in markings is not sexual, but dependent on certain conditions as yet unknown to us. Both forms appear to be equally common in N.W. India, from whence I have received them in considerable numbers.

"I have never received the form T. Æsiope, *Mén.*, from Japan, where typical Hecabe is common, but curiously enough I have seen large numbers of a Terias from Japan, which are, for the most part, indistinguishable from T. Brenda, *Doubl., Hew.*, originally described from West Africa, but which graduate insensibly in typical Hecabe, so that I am strongly inclined to believe that this form (Brenda) replaces in Japan the Æsiope of Queensland.

"The evidence is not so strong with regard to T. Sari, *Horsf.*, typical specimens of which seem exceedingly different from T. Hecabe, *L.* I possess, however, three specimens from Malacca, two of which are well-marked T. Sari, while the third, which is much smaller, presents certain peculiarities in the interior outline of the black hind margin of the anterior wings. Below, however, the quadrangular blotch distinctive of T. Sari is well-marked. A fourth specimen from the same locality, which must be referred to T. Hecabe, while presenting no trace of the blotch on the under side, exactly agrees in size, and in the markings of the upper side, with the third specimen just described. So that I think it is at least possible that T. Sari will ultimately be found to be but a form of the inconstant T. Hecabe."

Prof. Westwood suggested that the case might be analogous to that of certain English species of Pieris, where certain forms,—*e.g.*, P. Napææ,

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Esp., and P. Sabellicæ, *Steph.*,—now universally recognised as varieties of P. Napi, *L.*, had long been considered as specifically distinct. Prof. Westwood also suggested that attention should be paid to the times of appearance of the various forms, and the period noted during which they remained in the pupa stage.

Mr. A. G. Butler remarked that the latter circumstance had an important bearing on the case of Papilio Ajax, *Linn.* He expressed a doubt as to the correctness of the supposition that T. Sari was only a form of T. Hecabe, though he thought that the breeding of the latter and T. Æsiope from the same food-plant was a strong point in favour of their identity.

Papers read.

Mr. J. S. Baly communicated descriptions of new genera and species of Phytophagous Coleoptera.

Mr. C. O. Waterhouse read a paper on the Lamellicorn Coleoptera of Japan.

Mr. F. Smith read "Descriptions of New Species of Indian Aculeate Hymenoptera collected Mr. G. R. James Rothney;" and also a "Description of New Species of Bees of the Genus Nomia, *Latreille*." Referring to the latter, he mentioned that he was now acquainted with five species, the males of which were furnished with capitate antennæ.

April 5, 1875.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Report of the Commissioners of Agriculture for the year 1872'; presented by the United States Government. 'Monographs of the Diptera of North America,' part iii., by H. Loew; 'Directions for Collecting and Preserving Insects,' by A. S. Packard, jun., M.D.; 'New Species of North American Coleoptera,' by John L. Leconte, M.D., part ii.; 'Classification of the Coleoptera of North America,' by John L. Leconte, M.D., part ii.; by the Smithsonian Institution. 'Bullettino della Società Entomologica Italiana,' anno sesto, trim. i.—iv.; by the Society. 'The Journal of the Quekett Microscopical Club,' No. 28; by the Club. 'The Canadian Entomologist,' vol. vii., no. 2; by the Editor. 'L'Abeille,' tome xii., livr. 4 and 5; by the Editor. 'The Entomologist's Monthly Magazine,' for April; by the Editors. 'Newman's Entomologist' and 'The Zoologist,' for April; by the Editor. 'Exotic Butterflies,' part 94; by W. C. Hewitson, Esq.

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Election of a Member.

Mr. William Lucas Distant, of Streatham Cottage, Dulwich, was balloted for and elected an Ordinary Member.

Exhibitions, &c.

Mr. Jenner Weir exhibited a number of young Mantidæ that had emerged from an egg-case received from Ceylon, and remarked on their great resemblance to those recently exhibited from Borneo.

Mr. Bond exhibited a locust which had been taken alive at the bottom of a dry well near the Race Mill, Brighton. The species was uncertain.

Mr. Sealy read the following notes on the species of Ornithoptera exhibited at the last Meeting:—

"The insect occurs in tolerable abundance along the coast of South Malabar, Cochin, and Travancore. At the town of Cochin, where I live, it is frequently seen. I have also observed it many miles inland, flying over the trees in the low jungles at the foot of the Western Ghauts; but I have not noticed it at any great height above the sea. In Cochin I have seen it from March to August flying over the tops of the tallest cocoa palms, occasionally descending to hover over the flowers—especially those of the large scarlet Hibiscus, near which I have caught it in my own garden. The males seem less common than the females, and seldom were perfect on the wing. For several years I could get no information regarding the larva; none of the natives knew it, but last monsoon I obtained it, and during June and July many were collected; they fed upon Aristolochia indica, and apparently upon it only. The larvæ were very splendid, of a rich velvety black, with a lateral band and a saddle of white and red, very roughly tubercled, and the tubercles tipped with red. I cannot from memory attempt a closer description. A plate in "Wood's Natural History" of the imago and larva of a species there given as Ornithoptera Amphrisius corresponds very closely with this Cochin species. But there seems some doubt about its identity. On July 19, 1874, I obtained a large quantity both of larvæ and pupæ: the larvæ I fed upon Aristolochia, and many changed to pupæ From these many emerged before I left India (August 13), and others on board ship from the pupæ I took with me. They appear to remain about three weeks in pupa. The pupa possesses the power of making a curious noise, like "pha, pha," and makes it very loudly when touched; the noise is accompanied (perhaps produced) by a sharp contraction of the abdominal segments. I thought at first it was merely produced by the rubbing of one ring of the pupa case against the next, but the sound did not resemble a mere frictional sound, it was more like the sound of the rush of air through small holes, "pha, pha!" I tried to produce it with a dead chrysalis, but failed: the pupa sometimes contracted on being touched without making

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the noise, and appeared unable to make the noise until some time was given to allow it to recover its vigour.

"A curious incident connected with this insect came under my notice some years ago. In cleaning out the body of a female, I turned out a mass of apparently mature eggs, but they all proved unfertile: soon after, in operating upon another female, a slight pressure upon the body drove an egg out from the oviduct, and a repeated pressure extruded a second, the rest—20 or 30—would not come, and were taken out in emptying the body. The two which had been pressed through the oviduct hatched, and all the others shrivelled. I mention this as it seems a sort of confirmation of Von Siebold's observation respecting bees, that the fertilization of the egg takes place on its passage through the oviduct. The two larvæ lived two or three days, refusing every leaf I offered them; I did not then know Aristolochia was the food-plant."

Mr. Sealy also called attention to a peculiarity in the formation of the hind wings of the male, specimens of which he exhibited, there being a large pouch on the anal margin, filled with fluffy hair.

Mr. M'Lachlan read a letter he had received from an Englishman residing in Pueblo, Colorado, U.S., stating that he had grown potatoes in various parts of the Union, and that he was satisfied it was not necessary for the potato beetle to have pieces of haulm to support him whilst crossing the Atlantic, as he had found the insect in his potato pits, eating the tubers greedily; and that unless the English authorities took some steps to prevent the importation of potato bulbs, he believed the beetle would soon be in this country.

Mr. M'Lachlan drew attention to the following remark by Lieut. W. L. Carpenter, in his Report of the Zoological Collections made in Colorado during the summer of 1873 (extracted from the Annual Report of the U.S. Geological and Geographical Survey) with reference to the Colorado potato beetle:—

"This insect is still marching eastward, not a single specimen having been seen west of the dividing-ridge. It is probable that, should the potato be cultivated on the western water-shed, it would be free from the ravages of this destructive insect for a number of years; but that it would ultimately make its appearance in that region through the agency of the seed. This I believe to be the manner of their introduction to distant localities, as they are sluggish travellers, and quite incapable of spreading so rapidly by their own instinct. This belief is further sustained by their continued absence from the Salt Lake basin, occasioned by the cheapness of vegetables in the Mormon settlements excluding the importation of potatoes from Colorado. Not found at a greater altitude than 8000 feet."

Mr. Bates believed the distribution of the beetle depended more upon climatic conditions. The native home of the insect was the eastern

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plateaus of the Rocky Mountains, as far south as Mexico, and the climate of the West Coast of America being much more like the West Coast of Europe, their Faunas also bore a greater resemblance. He believed the absence of the insect from the west of the Rocky Mountains to depend upon the difference of climate, and the same cause might be expected to prevent the establishment of the insect in countries where the moisture of the atmosphere would probably be fatal to it.

Mr. Stevens remarked that on different occasions he had received the insect in great numbers in bottles from Orizaba.

Paper read.

Mr. Edward Saunders communicated the first part of a "Synopsis of British Hemiptera (Heteroptera)."

May 3, 1875.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Verhandlungen der k. k. zoologisch-botanischen Gesellschaft in Wien,' band xxiv.; presented by the Society. 'Tijdschrift voor Entomologie,' decl. xviii., afl. 2; by the Entomological Society of the Netherlands. 'Annales de la Société Entomologique de Belgique,' tome xviii., fasc. 1; by the Society. 'Report of the Entomological Society of the Province of Ontario for the year 1874;' by the Society. 'Sepp's Nederlandsche Insecten,' decl. iii., nos. 25—36; by the Author, Dr. S. C. Snellen van Vollenhoven. 'Recherches sur les phénonèmes de la digestion chez les Insectes;' by the Author, M. Félix Plateau. 'The Distribution and Correlation of Fossil Insects, and the supposed Occurrence of Lepidoptera and Arachnida in British and Foreign Strata, chiefly in the Secondary Rocks;' by the Author, the Rev. P. B. Brodie, M.A., F.G.S. 'The Canadian Entomologist,' vol. vii., no. 3; by the Editor. 'L'Abeille, 1875,' livr. 6; by the Editor. 'Nyer Slægter og Arter af Saltvands-Copepoder,' af Axel Boeck; 'Enumeratio Insectorum Norvegicorum Fasciculus I. Catalogum Hemipterorum et Orthopterorum continens,' auctore H. Siebke; 'Bidrag til Kundskaben om Dyrelivet paa vore Havbanker,' af G. O. Sars; 'Bemærkninger om de til Norges Fauna hoerende Phyllopoder,' af G. O. Sars; 'Om en dimorph Udvikling samt Generations vexel hos Leptodora,' af G. O. Sars; by the Royal University of Norway, Christiana. 'Proceedings of the Royal Society,' no. 160; by the Society. 'Newman's

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Entomologist' and 'The Zoologist,' for May; by the Editor. 'The Entomologist's Monthly Magazine,' for May; by the Editors. 'Illustrations of the Zygænidæ and Bombycidæ of North America,' by Richard H. Stretch; by the Author.

Election of Member.

On the recommendation of the Council, Professor Hermann Burmeister, of Buenos Ayres, was unanimously elected an Honorary Member of the Society.

Exhibitions, &c.

The President exhibited specimens of Stylops taken by himself, in the pupa state, in Andrena atriceps, at Hampstead Heath, on the 6th, 9th and 17th of April last. Mr. F. Enoch, who had been there on the 6th, at an earlier hour (between nine and ten o'clock), had been still more successful, having captured as many as seventeen males, one of which, however, was taken after 2 P.M. The President drew attention to the remarkable difference observable in the cephalothorax of the females in these specimens, as compared with those met with in Andrena convexiuscula, and remarked on the importance of not confounding the species obtained from different Andrenæ; Stylops Spencii having been derived by Mr. Pickering from A. atriceps, and figured by Professor Westwood, in the first volume of the 'Transactions' of this Society, while those obtained by Mr. Thwaites from A. convexiuscula had been associated with his name in a monograph of the family by the President in the volume for 1874, under the name of Stylops Thwaitesii.

Mr. M'Lachlan read an extract from a Report made to the Royal Society on the Natural History of Kerguelen's Island by the Rev. A. E. Eaton, who was attached, as naturalist, to the Transit of Venus Expedition to the island. Nearly all the insects were remarkable for being either apterous or with greatly abbreviated wings. There were two Lepidoptera, one (only a larva) probably belonging to the Noctuina, the other to the Tineina. Of the Diptera, one species had neither wings nor halteres; another lived habitually on rocks covered by the tide at high water, and its larva fed upon a species of sea-weed. All the larger Coleoptera seemed to have their elytra soldered together. Mr. M'Lachlan said that the theory as to the apterous condition of the insects was, that the general high winds prevailing in those regions rendered the development of wings useless; and Mr. Jenner Weir remarked that the apterous condition was correlated with the fact that plants under similar circumstances were apetalous and self-fertilising; and hence it was supposed that the existence of winged insects was unnecessary.

Mr. C. O. Waterhouse exhibited a Chekanops, of which he had discovered two specimens under the elytra of Passalus punctiger, from Rio Janeiro,

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thus confirming the statement that these insects attach themselves to the bodies of other insects after the manner of Acari.

Mr. C. O. Waterhouse also exhibited a drawing of a Neuropterous insect of the family Ascalaphidæ, from Swan River, presenting the peculiarity of having a large bifid hump on the basal segment of the abdomen dorsally, each division of the hump bearing a crest of hairs. He believed it to be the male of Suphalasca magna, *M'Lachlan*.

Mr. Wormald exhibited a collection of Neuroptera, &c., from the neighbourhood of Yokohama, received from Mr. H. Pryer. It contained several interesting species of Panorpidæ, including a new genus of that family, according to Mr. M'Lachlan; fine species of Osmylidæ, &c. Amongst the Trichoptera was a remarkable species of the genus Perissoneura, black with a large white spot in each wing, deceptively resembling a butterfly, especially an Ithomia.

A note was received from Mr. Albert Müller, stating that the galls taken by Mr. W. Cole on ash-leaves at West Wickham, as stated in the 'Proceedings' of this Society for 1874 (p. xix.), were produced by Cecidomyia botularia, *Winnertz*, and that a life-history of the fly was given by him in the 'Gardener's Chronicle,' 1870 (p. 1731), and reprinted in 'Newman's Entomologist' (v., pp. 248—250).

Professor Westwood communicated "Descriptions of some New Species of Short-tongued Bees belonging to the genus Nomia, *Latreille*"; and also a paper "On the Species of Rutelidæ inhabiting Eastern Asia and the Islands of the Eastern Archipelago."

Mr. C. O. Waterhouse communicated a description of a new species belonging to the Lucanidæ (Prosopocœlus Wimberleyi), by Major F. J. Sidney Parry; and also a description of the male of Alcimus dilatatus, by himself.

June 7, 1875.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Proceedings of the Royal Society,' no. 161; presented by the Society. 'Bullettino della Società Entomologica Italiana,' tome vii., trim. 1; by the Society. 'Mittheilungen der Schweizerischen Entomologischen Gesellschaft,' vol. iv., nos. 6 and 7; by the Society. 'Stettiner Entomologische Zeitung,' tome xxxvi., nos. 4—6; by the Society. 'Bulletin de la Société Impériale des Naturalistes de Moscou, Année 1874,' no. 3; by the

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Society. 'Bulletin of the Buffalo Society of Natural Sciences,' vol. ii., nos. 3 & 4; by the Society. 'A Monographic Revision and Synopsis of the Trichoptera of the European Fauna,' by Robert M'Lachlan, F.L.S., &c., part ii.; by the Author. 'The Canadian Entomologist,' vol. vii., no. 4; by the Editor. 'Revision de la Monographie des Élatérides,' par Ernest Candèze, M.A., &c., 1e fasc.; by the Author. 'Du Doryphora decemlineata,' par A. Prudhomme de Borre; by the Author. 'Descriptions of American Lepidoptera,' nos. 2—5; 'Remarks on Dr. Boisduval's "Lepidoptères de la Californie";' 'A Supplement to the "Descriptions of American Lepidoptera";' by the Authors, A. R. Grote and C. T. Robinson. 'On the Cotton Worm of the Southern States (*Aletia argillacea*, Hübner);' 'Descriptions of North-American Moths;' by the Author, A. R. Grote. 'The Entomologist's Monthly Magazine,' for June; by the Editors. 'Manuscript Notes from my Journal, or Illustrations of Insects, Native and Foreign—Diptera or Two-winged Flies,' by Townend Glover; by the Author. 'Report of the Commissioner of Agriculture for the year 1873'; 'Annual Report of the United States Geological and Geographical Survey of the Territories embracing Colorado, being a Report of Progress of the Exploration for the year 1873,' by F. V. Hayden, United States Geologist; by the Author. 'Coleopterologische Hefte,' Heft. xiii.; by the Editor, Baron E. v. Harold. 'The Journal of the Linnean Society,'—Zoology, no. 59; by the Society. 'Newman's Entomologist' and 'The Zoologist,' for June; by the Editor.

By purchase:—'The Zoological Record for 1873.'

Exhibitions, &c.

Mr. Briggs exhibited bred specimens of Zygæna Meliloti, accompanying them with the following remarks:—

"In 1872 and 1873 I reared young larvæ of Z. Meliloti from the New Forest, up to and through hybernation, but they died in the following springs; and these larvæ, from the minuteness of the markings on the ground colour, showed a great distinction from the young larvæ of Z. Trifolii of the same age.

"Last year (1874) I found small specimens of Z. Trifolii in company with Z. Meliloti. I therefore took especial care that the eggs I reared were from four typical pairs of (the New Forest) Z. Meliloti, found *in copulâ;* the eggs were (in all four cases) larger than the eggs of Z. Trifolii—a peculiarity I had remarked in previous years. Several of the moths I found difficult to refer with any degree of certainty to either (?) species. In the autumn many of the young larvæ had developed markings like those of Z. Trifolii.

"This spring (having failed in my two previous attempts), I put the Z. Meliloti, of which about thirty out of three hundred survived the winter,

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into a greenhouse, and in the result got nine pupæ; the major portion of the twenty-one others fed and grew with their companions for a while and then hybernated again. Of the nine pupæ six have now hatched and produced full coloured specimens of the small Z. Trifolii that I found in company with Z. Meliloti last year.

"The following questions suggest themselves:—

(1) Is the Z. Meliloti of the New Forest a separate species or a dwarfed form of Z. Trifolii?

(2) If a dwarfed form, did the additional greenhouse heat aid in developing it?

(3). If a separate species, can the specimens I bred from have paired with Z. Trifolii previously?

"I may add that I have compared M. Boisduval's description of the continental Z. Meliloti with the New Forest insect, and they do not agree in several particulars; and I have inspected the British Museum specimens of continental Z. Meliloti, and they also differ from the New Forest insect—especially in the form of the wings. The fact of the hybernation of the larva for a second year seems common. I have found it with Z. Trifolii and Z. Meliloti during the last three years, and it has been recorded of Z. Loniceræ. Out of one hundred larvæ of Z. Trifolii that survived last winter I obtained twenty-five pupæ (most of which are out); about twenty died, and the rest resumed hybernation, in the first week in June, in a greenhouse, the average daily temperature of which is 75°, and are now hybernating and apparently healthy."

Mr. M'Lachlan remarked that the insects of the genus hybridized very freely, and alluded to the possibility of their pairing more than once. Mr. W. A. Lewis had noticed that Z. Meliloti was by far the commonest insect in the part of the New Forest which forms its head quarters, and that, as it appeared to have been only discovered there of late years, it might be a stunted form which had been developed recently. Mr. Weir said that he had taken the insect twenty years ago in Tilgate Forest.

The Rev. A. E. Eaton exhibited the insects recently taken by him in Kerguelen's Island. There were about a dozen belonging to the Coleoptera, Lepidoptera and Diptera, besides some specimens of bird-lice and fleas.

Mr. Briggs exhibited a specimen of Halias prasinana, which when taken was heard to squeak very distinctly, and at the same time a slender filament issuing from beneath the abdomen was observed to be in rapid motion, and two small spiracles close to the filament were distinctly dilated.

The President called attention to a living larva which he had that morning extracted from the body of a stylopized female of Andrena Trimmerana, taken at Reigate on the 4th of June,—this larva having a long attenuated telescopic process at the anterior extremity, and two piceous reniform appendages behind, like that of Conops, which he had frequently reared from Pompilus,

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Sphex and Odynerus, as described by him in our 'Transactions' (vol. iv., ser. 2, 1858, pl. 28). These larvæ had also been met with in Bombus by Latreille, Dufour and others, as well as in Osmia, but not in Andrena, which moreover had been doubly victimized in the present instance, having the greater portion of the abdomen preoccupied by another invader, and thriving in spite of this and of the Conops larva subsequently lodged at the base.

The Secretary exhibited some specimens of a minute Podura forwarded to him by the Secretary of the Royal Microscopical Society, having been found on the snow of the Sierra Nevada in California.

Mr. F. H. Ward exhibited some microscopic slides showing specimens of a flea attached to the skin of the neck of a fowl, and which remained there after the death of the fowl.

Papers read, &c.

Prof. Westwood communicated descriptions of a new genus (Allochotes) of Clerideous Coleoptera from the Malayan Archipelago.

Mr. M'Lachlan read a paper entitled "A Sketch of our present Knowledge of the Neuropterous Fauna of Japan (excluding Odonata and Trichoptera)."

New Part of 'Transactions.'

Part 1 of the 'Transactions' of the Society for 1875 was on the table.

July 5, 1875.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Fedtschenko's Travels in Turkestan,' tome ii., part 5—Neuroptera, by R. M'Lachlan; presented by the Author. 'Proceedings of the Scientific Meetings of the Zoological Society of London,' 1874, part iv.; 1875, part 1; by the Society. 'Seventh Annual Report on the Noxious, Beneficial, and other Insects of the State of Missouri, made to the Board of Agriculture, pursuant to an Appropriation for the purpose from the Legislature of the State,' by Charles V. Riley, State Entomologist; by the Author. 'The Canadian Entomologist,' vol. vii., no. 5; by the Editor. 'Newman's Entomologist' and 'The Zoologist,' for July; by the Editor. 'The Entomologist's Monthly Magazine,' for July; by the Editors. 'Exotic Butterflies,' part 95; by the Author, W. C. Hewitson, Esq.

By purchase:—'Skandinaviens Hymenoptera,' bearbetade af C. G. Thomson, vol. iii., parts 1 and 2.

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The President announced the decease of Mr. Henry Doubleday, one of the Original Members of the Society; and Mr. Stainton made some remarks on his entomological labours, and on the great service he had done for Entomology in correcting the nomenclature of the British Lepidoptera.

Election of Members.

Alfred Forbes Sealy, Esq., of Cochin, South India, and William Borrer, jun., Esq., of Cowfold, Sussex, were balloted for and elected Ordinary Members; and W. D. Gooch, Esq., of Spring Vale, Natal, was elected a Subscriber.

Exhibitions, &c.

Mr. Dunning remarked that the Ornithoptera bred by Mr. Sealy from larvæ taken at Cochin, South India, and exhibited by him at a recent meeting, had been identified as O. Minos.

Mr. Bond exhibited two specimens of a Curculio, sent by Mr. Griffin from Nova Fribourgo, Brazil, which were attached to the same twig and were both attacked by a fungus. Mr. Janson said that they belonged to the genus Heilipus, and were well known to be subject to such attacks.

The President exhibited a lock taken from a gate at Twickenham entirely filled with the cells of a species of Osmia, which Mr. Smith said was most probably O. bicornis, of which he had known several instances in locks. The larvæ were still alive and healthy.

The President also exhibited an example of the minute Hylechthrus Rubi, one of the Stylopidæ, parasitic upon Prosopis rubicola, recently obtained from briars imported from Epirus, and remarked upon a method of expanding the wings of Stylopidæ. In repose these wings were rolled up in an elongate form; but he found that by pressing them gently forward from below they suddenly became erect, and then easily retained an expanded position. He further exhibited males and females of Spilomena troglodytes (one of the Crabronidæ) reared from bramble stems found at Shere, in Surrey; also a series of Halictus nitidiusculus, stylopized, and recommended entomologists going to the south coast in August to search for stylopized Halicti, especially on thistles. Finally, he remarked on the parasites of Osmia and Anthidium; and exhibited two specimens of the Coleopterous genus Zonitis (Z. mutica and Z. bifasciata) reared from the cells of Osmia tridentata, and a third (Z. præusta) from those of Anthidium contractum, which latter had also produced two species of Chalcididæ (Leucospis dorsigera and Eurytoma rubicola). He enumerated eleven insects as attacking the same Osmia in various stages, of which he had himself reared six species, including the two Zonites aforesaid, the other four being Cryptus bimaculatus, Melitobia Audouini, Halticella Osmicida and Chrysis indigotea; some of which had been recorded by Dufour and Perris,

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together with Stelis minuta and two species of Diptera (Senometopia spinipennis and Conops flavipes); two other Crypti (C. confutor and C. signatorius) being cited by Dr. Giraud. The Zonitis devoured the egg and pollen-paste whereon the Stelis also subsisted; the Chrysis, Crypti and Senometopia fed upon the soft larvæ externally; Halticella was reared within the more solid adult larvæ, whose tegument, desiccated and black (as in specimens exhibited) served for the hybernation of the parasite; the Melitobia destroyed the nymph in its soft state by external attack, and the Conops deposited its egg in the body of the bee itself after maturity. Specimens of this Osmia alive, and of the briars from which they were produced, were also exhibited.

Mr. Champion exhibited a series of recently captured individuals of Chrysomela cerealis from Snowdon, its only known British locality. Mr. M'Lachlan stated that he had recently seen this species in the Department of the Saône et Loire, in France, in great numbers, each ear of wheat having several of the beetles upon it, and remarked on the singular nature of its sole habitat in Britain.

The Secretary exhibited nests of a trap-door spider containing living inmates, sent from Uitenhage, near Port Elizabeth, by Mr. Henry W. Bidwell, a member of the Legislative Assembly of the Cape of Good Hope. The nests were not (as is usual) in the earth, but in cavities in the bark of trees, and the "trap-door" appeared to be formed of a portion of the bark, thus rendering it most difficult to detect the nests when in a closed condition. The Secretary was also informed that similar nests were constructed in door-posts and other places.

Mr. Riley, State Entomologist of Missouri, exhibited sundry of the insect pests that do so much damage in the State, including the army worm (*Leucania unipuncta*) and the Rocky Mountain locust (*Caloptenus spretus*), and entered at some length into the habits of the latter insect, and the vast amount of destitution caused by it, stating that in a short period it devoured almost every living plant, leaving nothing but the leaves of the forest trees, and converting a fruitful country into an absolute desert. From a knowledge of the habits of the insect, and believing in its inability to exist in a moist climate, he had predicted that its ravages would not extend beyond a certain line, and he had seen these predictions fulfilled almost to the letter. Having noticed that hogs and poultry grew excessively fat from devouring the locusts, and considering that the use of them as food for man would tend to relieve some of the distress occasioned in the devastated districts, he had, shortly before leaving St. Louis, organized a banquet, at which locusts, prepared in several ways (especially in the form of soup), were served up, and they were pronounced to be excellent. He distributed a number of baked locusts among the members present, but did not recommend them for food in that state, as the chitinous external

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tegument and the spines required to be removed before they were fit for digestion.

Mr. Riley also stated that he was very desirous of taking a supply of the cocoons of Microgaster glomeratus to America, to lessen the ravages of the larvæ of the genus Pieris on that continent, and he would be greatly obliged to any entomologist who could assist him in obtaining them.

Papers read, &c.

The following papers were communicated:—

"Descriptions of new Heteromerous Coleoptera belonging to the Family Blapsidæ." By Professor J. O. Westwood, M.A., &c.

"Description of a new Species of Lucanidæ, with a Note on Lissotes obtusatus." By Professor J. O. Westwood, M.A., &c.

"Description of a new Species of Myriapod from the borders of Mongolia." By Arthur G. Butler, F.L.S., F.Z.S., &c.

"Descriptions of new Coleoptera from Australia (Port Bowen)." By Charles O. Waterhouse.

Mr. Hewitson forwarded a note respecting a paper by Mr. Butler in the first part of the 'Transactions' for 1875, in which it was suggested respecting Netrocoryne beata and N. denitza, that Hewitson's figures of those species [Exot. But., vol. v.] were wrongly numbered. Mr. Hewitson said they were numbered quite correctly, and that he believed they would be found to be the sexes of N. beata.

The President stated that this was the last meeting that would be held at Burlington House; and that due notice would be given to the members when the arrangements at the new Rooms of the Society at 11, Chandos Street, Cavendish Square, were completed; the Library having been already removed to that place.

Mr. Dunning proposed and Mr. M'Lachlan seconded a cordial vote of thanks to the Linnean Society for the permission to hold the meetings at their Rooms, so long enjoyed by the Entomological Society. This was carried by acclamation.

November 3, 1875.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

This being the first meeting of the Session, the President read the following address:—

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Gentlemen,—On the opening of our new Meeting Room and Library, at the commencement of the present Session, it may be fitting to inaugurate our reunion and installation here by a few introductory remarks.

Your Council has long been conscious of the many inconveniences experienced from the former inaccessible position of our Library at Bedford Row and its disconnection with our Meeting Room, conceded to us by favour of the Linnean Society at Burlington House. The numerous additions, moreover, to our bibliographical collection having superadded want of space to other exigencies, it has been deemed expedient to provide for these requirements in combination with some other Society capable of affording us adequate accommodation.

By the unremitting exertions of our Secretary, Mr. Grut, this has finally been accomplished; and although the advantages of bringing our Library and Meeting Room into juxtaposition in a more central site must necessarily involve a certain increase in our annual expenditure, it may not unreasonably be anticipated that the beneficial influences resulting therefrom will not be confined to those only who now muster in our ranks, but will also constitute a source of attraction to others.

Arrangements have likewise been made whereby, as already intimated in convening this meeting, our Library will be open to Members and Subscribers every Monday from two to seven o'clock, as heretofore, and on every Wednesday and Friday from two to five o'clock, instead of one day in the week.

I must also bring under your notice that we are indebted to the liberality of one of our Members for a further proof of the interest which he has on several other occasions exhibited on behalf of this Society, in providing for the entire expense of transferring our Library to this locality, as well as of the glazed book-cases and fittings requisite for its reception.

In connection with these ameliorations it has been found necessary to alter the days hitherto appointed for our meetings from Monday to Wednesday, the former day in each week being already appropriated to the meetings of the Medical Society. Our Anniversary Meeting, however, will still be held on the fourth Monday in January, as prescribed by the Bye-Laws, but at an earlier hour—namely, at five o'clock in the afternoon.

It has also been deemed opportune to revert to the former custom, as originally provided by the founders of this Society, of holding our meetings in the first week of each month throughout the year, instead of having certain bi-monthly meetings to obviate the difficulty arising from the closing of the rooms at Burlington House during the summer recess.

Having thus adverted to the changes made with a view to promote the interests of this Society and the convenience of its Members, I would further draw your attention to the expansion which it has been deemed advisable to give to the usual custom of introducing friends at our

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meetings, by throwing open our doors to all entomologists indiscriminately on this occasion as appertaining to one and the same system, actuated by corresponding impulses, and influenced by similar attractions in common with ourselves. Our policy is not one of exclusiveness, but rather that of fostering and developing new sources of emulation from within and from without, which can best be effected by cultivating a closer intimacy with those who are fellow-labourers in the same field. To all such we tender a hearty welcome.

I would venture, in conclusion, to suggest to some few of our most esteemed Members, who are habitual absentees, the benefits which they might be enabled to confer by returning to our horizon from their remoter orbits in the realms of ether, and shedding new lustre upon our discussions.

We are each of us more or less liable to be called upon in various ways to satisfy the importunities of conventional obligations; and in looking forward to the future as fraught with propitious augury, we must rely upon the zealous co-operation of all to improve our vigour and efficiency.

We will now proceed, Gentlemen, to the ordinary business of the evening.

On the proposal of Mr. Sheppard, seconded by Mr. Bates, it was agreed that the thanks of the meeting be given to the Members of Council and the Secretary for the trouble they had taken on behalf of the Society in making arrangements for the new Meeting Room and Library, and in removing and entirely re-arranging the collection of books. Also, that the thanks of the meeting be given to the Member who had so generously aided the Society by undertaking to provide the expenses of removal to Chandos Street.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Memoirs of the Boston Society of Natural History,' vol. ii., part iii., nos. 3—5; part iv., no. 1; 'Proceedings,' vol. xvi., parts iii. and iv.; vol. xvii., parts i. and ii.; presented by the Society. 'Bulletin of the Buffalo Society of Natural Sciences,' vol. ii., no. 1; by the Society. 'Transactions of the Linnean Society of London,' vol. xxx. in three parts, N.S., Zoology, vol. i., part 1; by the Society. 'Proceedings of the Scientific Meetings of the Zoological Society of London,' 1875, parts 2 and 3; by the Society. 'Bullettino della Società Entomologica Italiana,' t. vii., trim. 2; by the Society. 'Transactions of the American Entomological Society,' vol. v., sheets 1—14; by the Society. 'Bulletin de la Société Impériale des Naturalistes de Moscou,' 1874, no. 4; by the Society. 'Boletin de la Academia Nacional de Ciencias exactas existente

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en la Universidad de Cordova,' entrega iv.; by the Academy. 'Horæ Societatis Entomologicæ Rossicæ,' t. xi., no. 1; by the Society. 'Mittheilungen der Schweizerischen Entomologischen Gesellschaft,' vol. iv., no. 4; by the Society. 'Annales de la Société Entomologique de Belgique,' t. xviii., fasc. 2; by the Society. 'Coleoptera Jekeliana,' livr. 1 & 2; by the Author, M. H. Jekel. 'Statistique Scientifique d'Eure-et-Loir—Lepidoptères,' par M. Achille Guenée; by the Author. 'Recensis Orthopterorum, Revue critique des Orthoptères décrits par Linné, de Geer et Thunberg,' par C. Stal; by the Author. 'Exotic Butterflies,' part 96; by the Author, W. C. Hewitson, Esq. 'Monthly Reports of the Department of Agriculture for the year 1874,' Washington, 1875. 'A Monographic Revision and Synopsis of the Trichoptera of the European Fauna,' by Robert M'Lachlan, F.L.S., part 3; by the Author. 'Rapporti tra Insetti et tra Nettarii estranuziali in alcune Piante,' di Frederigo Delpino; by Sir John Lubbock, Bart., M.P. 'Notes sur des empreintes d'Insectes fossiles découvertes dans les schistes houillers des environs de Mons,' par A. Preudhomme de Borre; by the Author. 'L'Abeille,' t. xii., 4 livr.; t. xiii., 4 livr.; by the Editor. 'The Journal of the Quekett Microscopical Club,' no. 29; by the Club. 'Proceedings of the Royal Society,' nos. 162 and 163; by the Society. 'The Canadian Entomologist,' vol. vii., nos. 6, 7 and 9; by the Editor. 'Newman's Entomologist' and 'The Zoologist,' August—November; by the Editor. 'The Naturalist,' nos. 2—4; by the Editor. 'Transactions of the Watford Natural History Society and Hertfordshire Field Club,' vol. i., part 1; by the Society. 'The Entomologist's Monthly Magazine,' August—November; by the Editors. 'Stettiner Entomologische Zeitung,' t. xxxvi., nos. 7—9; by the Society.

Election of Member.

M. Oscar Lamarche, of Liège, was balloted for and elected a Foreign Member of the Society.

Exhibitions, &c.

Mr. Boyd exhibited specimens of the mines of Heliozela sericiella. He had succeeded in rearing the insects, by confining them with a young oak-plant, and thus was enabled to discover their habits, of which nothing had hitherto been known. The mines were formed in the foot-stalks of the leaves.

Mr. M'Lachlan exhibited a living apterous female of a Trichopterous insect, Enoicyla (probably E. pusilla, *Burm.*). He had recently bred it, with others, from cases forwarded to him by Mr. Fletcher, of Worcester, the discoverer of the insect in this country. Mr. M'Lachlan gave an account of its structure and singular habits. The perfect insects emerge in November, the males being furnished with ample wings.

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Mr. Champion exhibited examples of the following Coleoptera recently captured by himself, *viz.*, Cryptophagus populi (varying greatly in size and colour) taken from the burrows of Colletes Daviesana, near Farnham, Surrey; Orchestes semirufus, *Gyll.?* from Woking; Epurœa neglecta, beaten from faggot-stacks at Darenth Wood; and Psammodius porcicollis from Whitsand Bay. The last-named had been taken by Mr. S. S. Walker.

Mr. Phipson exhibited a specimen of Catocala nupta, which had a number of Acari attached to one of the anterior wings, instead of being attached to the body as is usually the case.

Mr. Boyd exhibited a living Myriapod from the West Indies, which was identified by Mr. Butler as a species of Spirobolus.

Papers read, &c.

The Rev. H. S. Gorham read descriptions of some new species and a new genus of Endomychici.

Mr. Arthur G. Butler communicated "A List of the Lepidoptera referable to the Genus Hypsa of Walker's List, with Descriptions of some new Genera and Species."

Mr. Edward Saunders communicated a second part of his Synopsis of the British Hemiptera-Heteroptera.

Mr. Charles O. Waterhouse read descriptions of some new genera and species of Heteromerous Coleoptera (*Helopidæ*), chiefly from Tierra del Fuego. The specimens had been brought to this country by Mr. Charles Darwin, and had been described many years ago by Mr. Waterhouse, sen., in a paper on the classification of the Heteromera; but the portion of the paper containing the descriptions was unfortunately lost, and the insects remained unnoticed till the present time.

New Part of 'Transactions.'

The second Part of the 'Transactions' of the Society for 1875 was on the table.

December 1, 1875.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Mémoires de la Société de Physique et d'Histoire Naturelles de Genève,' tome xxiv., première partie; presented by the Society. 'Bulletin de la Société Impériale des Naturalistes de Moscou, 1875,' No. 1; by the Society. 'Bullettino della Società Entomologica Italiana,' vol. vii., trimes. 3;

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by the Society. 'Bulletin de la Société d'Histoire Naturelle de Toulouse,' vol. ix., fasc. 2; by the Society. 'Verhandlungen des Vereins für Naturwissenschaftliche Unterhaltung zu Hamburg, 1871—74;' by the Society. 'Proceedings of the Linnean Society,' Session 1874–75; 'Additions to the Library of the Linnean Society, 1874–75;' by the Society. 'Journal of the Royal Agricultural Society of England,' vol. xi., pt. 2, no. 12; by the Society. 'A Collection of the Arachnological Writings of Nicholas Marcellus Hentz,' edited by Edward Burgess; by the Boston Society of Natural History. 'Mémoire sur les premiers états de l'Hépiale Louvette (*Hepialus lupulinus*),' par Xavier Raspail; by the Author. 'Nouvelles Recherches tendant à établir que le prétendu Crustacé décrit par Latreille sous le nom de Prosopistoma est un veritable insecte de la tribu des Ephémérines par le Professeur N. Joly;' by the Author. 'Catàlogo de los Insectos Chilenos por Don E. C. Reed;' by the Author. 'L'Abeille,' tome xii., livraison 16; by the Editor. 'Newman's Entomologist' for December; by the Editor. 'Entomologist's Monthly Magazine' for December; by the Editors. 'The Zoologist' for December; by the Editor. 'The Canadian Entomologist,' no. 10; by the Editor. 'Transactions of the Watford Natural History Society and Hertfordshire Field Club,' vol. i., part 2; by the Society. 'The Naturalist: Journal of the West Riding Consolidated Naturalists' Society,' no. 5; by the Society. 'Petites Nouvelles Entomologiques,' no. 136; by the Editor. 'La possibilité de la Naturalisation de la Leptinotarsa decémlineata, examinée au point de vue de la concurrence vitale,' par A. Preudhomme de Borre;' by the Author.

Election of Subscriber.

Thomas Chapman, Esq., of Buchanan Street, Glasgow, was balloted for and elected a Subscriber to the Society.

Exhibitions, &c.

Mr. W. A. Forbes exhibited a variety of the Burnet Moth (*Zygæna Filipendulæ*), with yellow (instead of red) spots, of which he had bred several from larvæ taken near Winchester. They were bred with others of the ordinary colour; but he believed that the variety was natural and not caused by extraneous circumstances.

Mr. G. C. Champion exhibited specimens of Anisotoma oblonga, *Er.*, taken by himself near Farnham, and A. curta, *Fairm.*, from Esher, Surrey. The latter was new to the British list. Also A. Algirica, a new species taken by Mr. Rippon in Algiers. They had all been described by Mr. Rye in the 'Entomologist's Monthly Magazine' for this month.

Mr. William Cole exhibited carefully-executed drawings of the pupæ of a species apparently belonging to the Dipterous genus Ephydra, which he had taken clinging to the stems of grass below high-water mark near Southend.

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The water whence it was taken was brackish. He also exhibited the larvæ and perfect insects in spirits.

The President stated, with reference to the numerous parasites found on Osmia tridentata, that M. Jules Lichtenstein, of Montpellier, had recently obtained the Zonitis præusta from the cells of this bee; and likewise the Euchalcis vetusta, *Duf.*, from its desiccated adult larvæ, in the same way that Halticella Osmicida effects its metamorphosis, thus making the thirteenth parasite recorded as affecting this Osmia.

Paper read.

Professor Burmeister, of Buenos Ayres, communicated the description of a new Coleopterous insect, which he had named Obadius insignis, in honour of Professor Westwood on his attaining the seventieth year of his age, on the 22nd December, 1875.

New Part of 'Transactions.'

The third Part of the 'Transactions' for 1875 was on the table.

January 5, 1876.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Exotic Butterflies,' part 97; presented by the Author, W. C. Hewitson, Esq. 'Mittheilungen der Schweizerischen Entomologischen Gesellschaft,' vol. iii., nos. 5 and 10; vol. iv., nos. 1 and 2; by the Society. 'Proceedings of the Natural History Society of Glasgow,' vol. i., parts 1 and 2; vol. ii., part 1; by the Society. 'Proceedings of the Royal Society,' vol. xxvi., no. 164; by the Society. 'L'Abeille,' 1875, liv. 17 and 18; by the Editor. 'The Zoologist,' for January; by the Editor. 'Newman's Entomologist' for January; by the Editor. 'The Entomologist's Monthly Magazine' for January; by the Editors. 'Proceedings of the Dublin University Biological Association,' vol. i., no. 1; by the Association.

Election of Members.

Messrs. F. J. Horniman and D. G. Rutherford were balloted for and elected Ordinary Members; and Professor W. Dickson, of Glasgow University, and Mr. F. Enock were elected Subscribers.

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Exhibitions, &c.

The Rev. R. P. Murray exhibited a collection of Lepidoptera taken by himself in the Higher Alps, amongst which were some interesting mountain varieties.

Mr. S. Stevens exhibited a specimen of a dragonfly, rare in this country (Æschna mixta), which he had picked up, nearly dead, in his garden at Upper Norwood in the middle of November.

Mr. Champion exhibited specimens of Coleoptera, *viz.*, Aleochara hibernica, *Rye*, taken at Slieve Donardh, Ireland; Homalota egregia, *Rye*, from Caterham; and Cryptophagus subfumatus, *Gyll.*, taken in the London district.

Papers read, &c.

Mr. H. W. Bates communicated a paper entitled "Additions to the list of Geodephagous Coleoptera of Japan, with synonymic and other remarks."

Mr. W. H. Miskin, of Queensland, communicated a description of a new and remarkable species of moth belonging to the genus Attacus, of which a male and a female specimen had been taken in the neighbourhood of Cape York. He had named the species A. Hercules. The expanse of the wings measured nine inches, and the hind wings were furnished with tails. The specimens had been deposited in the Queensland Museum.

Mr. C. O. Waterhouse forwarded a paper "On various new Genera and Species of Coleoptera," belonging to the Geodephaga, Necrophaga, Lamellicornia and Rhyncophora.

New Part of 'Transactions.'

Part iv. of the 'Transactions' for 1875 was on the table.

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ANNUAL MEETING,

January 24, 1876.

Sir SIDNEY SMITH SAUNDERS, G.M.G., President, in the chair.

An abstract of the Treasurer's accounts for 1875 was read by Mr. J. Jenner Weir, one of the auditors, showing a balance of £286 0s. 11d. in favour of the Society.

The Secretary then read the following:—

Report of the Council for 1875.

In accordance with the Bye-laws the Council presents to the Society the following report:—

Since the last annual meeting, 15 members and subscribers have been elected, whilst 8 have been removed by resignation or death. The Society has lost Henry Doubleday, one of the original members, and John Edward Gray, a former President. Prof. Burmeister has been placed on the list of honorary members, in the room of the late Prof. Zetterstedt.

The Transactions for 1875 contain 21 memoirs, besides an appendix on Entomological Nomenclature, the whole forming a volume of 384 pages, exclusive of the Proceedings, with nine plates. A donation of ten guineas from Mr. Robinson-Douglas, to be applied to the publication of papers on British or European Entomology, has been appropriated to Mr. Edward Saunders' Synopsis of British Hemiptera-Heteroptera; and the whole expense of printing the paper on Nomenclature has been defrayed by the author, Mr. W. Arnold Lewis.

The financial statement of the year may be summarized as follows:—

RECEIPTS.		PAYMENTS.	
Contributions of Members	£190	Publications	£141
Sale of Publications	91	Rent and Office Expenses	94
Life Compositions	31	Compositions Invested	31
Interest on Consols	6	Library	5
Donations	28	Tea at Meetings	12
	£346		£283

The unusually large balance in hand of £63 is, however, more apparent than real, and the greater part thereof will be required to meet expenditure in the Library, which has been already authorized. So long as the Library

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remained in Bedford Row, few purchases were made for want of space; whilst its removal to Chandos Street is so recent that time has not sufficed to do all that is desired. The next step will be to place in the binder's hands every volume now unbound, and the Council has given instructions to that effect.

The largely increased sale of the Society's publications is a satisfactory feature of the financial summary. And the Council has resolved that, in future, metropolitan members and subscribers who, in addition to their subscription for the current year, shall at or before the April meeting pay a further contribution of half-a-guinea, shall be entitled to a copy of the Transactions for the year. In other words, a town member, by making this additional fixed payment beforehand, will be able to place himself, as regards the receipt of our publications, in the same position as a country member.

The removal of the Society to its present abode and the re-union of our Library and Meeting-room under the same roof are unquestionably the chief incidents of the year in the Society's affairs. This has necessitated an alteration in our day of meeting from Monday to Wednesday; but on the other hand the original practice of one scientific meeting in each month throughout the year has been restored.

The Library has been re-arranged; and some new book-cases have been presented, for which, and for defraying all the expenses attendant upon removal, the Society is indebted to Mr. Dunning.

One circumstance which greatly influenced the Council in the selection of new rooms, was the opportunity afforded, by entering into friendly relations with the Medical Society, of giving greater facilities for the use of the Library. In the infancy of the Society, and when our books were few, the requirements of the case were sufficiently met by a weekly attendance of the Librarian; but as our stores have accumulated until the Library has become a valuable repository of works on all branches of our Science, it has been increasingly felt that some new arrangement was required, and that to keep the books inaccessible except on one day out of seven was a measure to be justified only by dire necessity. Consulted or not consulted, the books ought to be accessible; and whether the privilege is much used or little used, our members ought to have the power of consulting them, and have a right to require that the Society shall do its utmost to render such consultation possible. It is with great pleasure the Council announces that, by availing ourselves of the services of the Sub-librarian of the Medical Society, who resides on the premises, it will be feasible to have the Library open every week-day from 1 to 6 p.m., and on the days of meeting till 9 p.m., either for purposes of reference or for borrowing books in accordance with the Bye-Laws. It is with this view that the Council recommends the election of Mr. Poole as Librarian.

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It deserves consideration whether it would not be desirable to make an alteration in our Bye-Laws, by repealing the provision which excludes the Librarian from the Council, appointing as Honorary Librarian one of our own body, who shall be *ex officio* one of the Council, like the Treasurer and Secretaries, and employing a salaried officer as Sub-librarian. The Council will be glad to ascertain the opinion of members on this question, with a view to taking action thereon during the ensuing year. In the meantime, one of the Secretaries, or some other member of the Council, will endeavour to attend at the Society's Rooms on the Wednesday in every week.

The Council gladly avails itself of this opportunity to express its appreciation of the self-denying manner in which Mr. Janson has facilitated the new arrangements in connexion with the Library; unable himself to give a daily attendance at the rooms, he has not allowed his own interest or desires to stand in the way or interfere with measures designed to extend the usefulness of the Society. He retires, not without regret, from an office to which he was first elected in 1850; what was then a mere handful of books has, during his custodianship, expanded into a library not unworthy of the Society; and the Council feels sure that his services of more than a quarter of a century will receive at your hands the recognition they deserve.

The Librarian is not the only officer who retires. The Treasurer and the junior Secretary do not desire re-election; and the Bye-Laws require us to choose a new President.

It is seldom that so many changes occur simultaneously in the Society's staff. But in electing Prof. Westwood to the chair, the traditions of the past will be preserved; and relying on the co-operation of all the members, the Council has confidence in the future of the Society, whose continued prosperity betokens a widening sphere of usefulness.

January 24, 1876.

The following gentlemen were elected Members of Council for 1876:—Sir John Lubbock, Bart., Sir Sidney Smith Saunders, Professor Westwood, and Messrs. H. W. Bates, A. G. Butler, G. C. Champion, J. W. Dunning, F. Grut, R. McLachlan, R. Meldola, Rev. R. P. Murray, H. T. Stainton, and J. Jenner Weir.

The following officers were elected for the year 1876:—President, Professor Westwood, M.A., F.L.S., &c.; Treasurer, Mr. J. Jenner Weir; Secretaries, Messrs. F. Grut and R. Meldola; Librarian, Mr. W. E. Poole.

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The President then read the following Address:—

THE PRESIDENT'S ADDRESS.

GENTLEMEN,

The recurrence of our Anniversary Meeting calls upon me to mention some of the principal subjects which have occupied the attention of our fellow-labourers at home and abroad during the past year; and, in epitomising the results of their investigations, to render these materials available as an inducement to prosecute further researches in that branch of Natural History to which this Society is specially devoted.

With the full consciousness of our obligations to the Linnean Society for the facilities afforded us by the use of their rooms during a considerable period; and, no less so, of the kindred relations which still unite us in the future; we cannot but congratulate ourselves in having now attained an independent position, and established ourselves upon a footing immeasurably superior to that of any antecedent period, with corresponding assurances of the beneficial influences derivable therefrom.

In fact we seem, as it were, to have just emerged from a state of arrested development; and we may confidently look to this transition for new elements of vigour and vitality in the expansion of our scientific energies.

You will have learned from the Report of the Council that the accounts of the past year show a satisfactory balance of receipts over expenditure; and that it is intended to afford further facilities of access to our Library by the appointment of a resident Librarian; Mr. Janson, who has occupied this post for so many years, and who has proved so efficient on all occasions, being unable to devote more of his time than hitherto to this important object; and, furthermore, that the Council have decided to reduce the price of our publications for all Metropolitan Members residing within a circuit of fifteen miles, to a fixed contribution, at their option, of half-a-guinea per annum, with free delivery at their respective residences.

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Obituary.

I have had occasion to bring under your notice during the past year the losses we have sustained by the death of two eminent Members of our Society, on whom appropriate panegyrics were delivered by Professor Westwood and Mr. Stainton.

Dr. John Edward Gray, who died on the 7th of March last, aged seventy-five, had filled the post of Keeper of the Zoological Collection in the British Museum since 1840, which post he resigned a few months before his death. The vast number of papers which have emanated from his pen, and which have borne him a rich harvest of renown in the field of Science, are a standing record of his indefatigable assiduity; and although his literary labours were principally devoted to other branches of Natural History, the department of Entomology was indebted to him for much effective support in his official capacity; and he occupied the Presidential Chair of this Society in 1858 and 1859.

Henry Doubleday, well known as a Lepidopterist of the highest repute, died on the 29th of June last, in his sixty-seventh year. Notwithstanding his profound acquaintance with that order of insects to which he had attached himself from early youth, his writings have been limited to fragmentary records in various periodicals, with the exception of his 'Synonymic List of British Lepidoptera,' published in 1850, whereby he sought to reconcile the many discrepancies between the names then in use among Lepidopterists at home and abroad, and to harmonise these discordant elements as an essential prelude to international concert. He was one of the few remaining original Members of this Society, and had lived a retired life for many years past at Epping, where he died esteemed and lamented by all who knew him.

Economic Entomology.

The life-history of the Phylloxera has been already explained on a former occasion; and Mr. Riley, the State Entomologist of Missouri, whom we had the pleasure to welcome at one of our meetings, furnishes a corresponding epitome of the same in his Seventh Report for 1875. No inexpensive method of extirpating the evil has been found practically available on an extensive scale, excepting the process of submersion, where feasible; but the most important results have been obtained by the substitution of certain

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American stocks not subject to such attacks, which have successfully resisted invasion by the Phylloxera in the most contaminated localities; and which, as exempt from root-disease, may be advantageously grafted with any of the more susceptible and appreciated French varieties.

The satisfactory progress of such experiments during the last two years has been brought to the notice of the French Entomological Society by M. Jules Lichtenstein, of Montpellier (14th July), and may be held sufficient to justify the belief that the use of such stocks will serve to re-establish the prosperity of viticulture in the South of France.

The notion entertained by the last-named persevering observer—that the winged agamous females of the Phylloxera vastatrix resort from the vines to the Chermes oak to deposit their *eggs* or so-called *pupæ*, has been shown to be so far fallacious, that, as Mr. Riley observes, this species of oak not existing in America, the Phylloxera must there migrate to some other tree; in which cases the sexual race derivable therefrom, as well as the progeny of the latter, being apterous, and having no means of returning to any distant vines, "must inevitably perish," as in all other instances when, not unfrequently, borne away from their accustomed sites. On the other hand, the spreading of the disease from patch to patch, and from one locality to another, with unmolested intervals, has been plausibly ascribed to the progeny of the winged type when alighting on the vines; and indeed could hardly be effected otherwise.

As regards the proper definition of the *eggs* or *pupæ* deposited alike by the winged and apterous mothers of the sexual progeny, Mr. Riley terms them "*eggs or egg-like bodies*," and contends for the former appellation "because, when first laid, they are transparent with homogeneous contents; while the sexual individual developes within the covering very much as the embryonic larva developes within the egg" (p. 91, note). M. Lichtenstein maintains his former designation of *pupæ*, as giving birth at once to the mouthless sexual race, without any intermediate condition; the tegument being also of a silky or cottony character, differing from the ordinary egg-shell.*

The American potato-beetle—best known to Science as the Doryphora decem-lineata, although otherwise designated by

* *Vide* Proceedings of Ent. Soc. Fr., July 14, 28, and Aug. 11.

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various authors—has now reached the Atlantic sea-board at several points, as conspicuously announced in the first page of Mr. Riley's 'Seventh Annual Report on the Noxious and Beneficial Insects of the State of Missouri' for 1875.

Various discussions have taken place in entomological circles abroad during the year, as to the nature and extent of the precautions which may be deemed fitting to guard against the introduction of this pernicious insect; and, at the instance of the French Minister of Commerce, M. Milne-Edwards has submitted a Report upon this subject to the Académie des Sciences at Paris, published in the 'Comptes Rendus' of that Institution.*

The Belgian Entomological Society has also devoted considerable attention to this important topic, and has published in its 'Annales' communications from Dr. J. L. Leconte, of Philadelphia, Dr. Hagen and others, reposing mainly on information derived from Mr. Riley's previous Reports.

By the additional information now supplied we learn that, according to previous computations, the Doryphora would have reached the Atlantic four years later; this increased speed being attributed to the aid which the beetles obtained "in their onward course, from ships on the lakes and from cars on the railroads." Mr. Riley adds that "those who have watched the insect's gradual spread during the past seventeen or eighteen years from its native Rocky-Mountain home to the Atlantic, and have seen how the lakes, instead of hindering its march into Canada, really accelerated that march, by affording carriage on vessels, rafters and other floating objects, can have no doubt that the danger felt by our transatlantic friends is real."

He reiterates his opinion that, if the Doryphora ever obtains a footing in Europe, "it will most likely be carried there in the perfect beetle state;" in support of which opinion he observes that "while the *beetle*, especially in the non-growing season, will live for months without food, the *larva* would perish in a few days without fresh potato-tops, and would (he believes) starve to death in the midst of a barrel of potatoes, even if it could get there without being crushed; for, while it so voraciously devours the leaves, it will not touch the tubers. The eggs could only be carried over on the haulm or on the living plant;" the former, "on account of its

* 'Rapport sur les mesures proposées pour prévenir, en France, l'invasion des Doryphores qui attaquent la pomme de terre' (t. lxxx., No. 10, p. 609—Mars 15).

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liability to rot," not being "used to any extent in packing:" the only other possible danger being that of conveying the insect "in sufficiently large lumps of earth, either as larva, pupa, or beetle;" which he considers may be effectually prevented by requiring the American dealers "carefully to avoid the use of the haulm or straw, and to ship none but clean potatoes, as free as possible from earth."

He continues to dwell upon the importance of furnishing vessels "with cards giving illustrated descriptions of the insect in all its stages;" in order that "the passengers and crew may destroy any stray specimens that may be found" on board,—a precaution which, he states, has recently been adopted by the German Government. He, however, ridicules the idea that the beetle would not become readily acclimatized in this country if imported, and is "decidedly of opinion that they delude themselves who suppose that this Doryphora could not thrive in the greater part of Europe; and that to abandon all precautionary measures against its introduction, on such grounds, would be the height of folly."

He adds, with much plausibility, that an insect which has spread so widely in America and in such different latitudes—"in fact wherever the potato succeeds"—is not likely to "be discomfited in the potato-growing districts of Europe."

Mr. Riley also refers to "many authenticated cases of poisoning by the fumes from the scalded insects;" but does not ascribe such results to the so-called "Paris Green" (arseno-acetate of copper) employed in a diluted form with flour and water as a remedial measure. On the contrary, he states that since this "mixture came into vogue we have heard much less of potato-bug poisoning."

Dr. Leconte and others have entertained suspicions as to the deleterious effects of the arsenious acid upon the soil and upon the tubers themselves; but Mr. Riley contends that there is nothing to fear from the mixture in the highly diluted state now commonly adopted; and he appeals to the experience of the past six years, during which millions of bushels of potatoes have been thus raised, without any injurious consequences to the tubers or to the consumers.

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Habits and Instincts.

In the whole sphere of animal existence no domain offers a wider scope for the physiologist than the study of insect life, with its wonderful phases, its diversified instincts, and inexhaustible display of functional appliances. It is indeed from the life-history of such tribes and individuals that the most instructive lessons may be derived, as serving to exemplify the part which each is called upon to fulfil in the economy of the universe, and leading by induction to many important inferences bearing upon abstract theories of speculative philosophy. If, in fact, we limit our investigations to mere distinguishing characteristics, without extending our inquiries any farther, we are but taking a cursory glance at the index to Nature's great work, without looking to the more profound and interesting phenomena recorded in the text.

It has been the fashion of the day to elaborate new theories of development from antecedent epochs, and to attribute to adventitious circumstances all the marvellous results we now witness throughout Nature's realm. When, however, it becomes essential to reconcile hypothetical argument with the stern logic of facts, we find the Coryphei of the Evolutionary Propaganda at variance among themselves on fundamental principles: some of these, of the most advanced school, demonstrating, to their own entire satisfaction, the doctrine of 'spontaneous generation' as an essential element of new life, to be subjected in process of time to all the multitudinous 'differentiations' which their theory involves; and, in the climax of their enthusiasm, expounding the utter incompatibility of low forms of life remaining unchanged for illimitable periods amid their influential 'environments': while others—their compeers—censured for such irrational conceptions and illogical inferences as untenable assumptions — potently develop the fallibility of those impulsive convictions to which the former have thus triumphantly pinned their faith.

But by whatsoever imparted faculties and inherent tendencies the principles of Biology may be governed and maintained, the more we attend to the functional relations of the several races, as intimately associated with those structural endowments with which they are so eminently gifted, according to the exigency of their respective requirements, the more competent shall we become to

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form an independent opinion on those abstruse problems of descent and inheritance, the solution of which, to be consistent with such doctrinal precepts, cannot be held to affect the past alone, without involving the future also in the same overruling destinies.

Mr. Douglas has lately told us*—on the authority of one of our most esteemed Entomologists, the late J. F. Stephens—that predilections for particular orders of insects are apt to prevail in cycles,—that at one period the taste for one of these orders would seem to predominate, and for another at some other period; and he calls attention to the neglect which has befallen some of these in this country, and to the fields which lie fallow in consequence. This must be deemed the more surprising as regards the Hymenoptera—to which he first adverts—which Kirby has dignified "as the Princes of the insect-world," † and which present the greatest amount of intelligence, the most complex variety of industrial resources, and the readiest access to observation and research. Yet how few of our entomologists, comparatively speaking, have enrolled themselves in the ranks of their votaries, and how much recondite lore remains to be explored by a careful study of their habits and instincts!

The Hemiptera and the Diptera are also comprised by Mr. Douglas among the neglected class, where the harvest is plenteous, but the labourers are few.

It is, however, more especially from that wider domain already referred to, that we may look for the richest results,—when the charms of the matured form alone shall prove less seductive to the many,—when the study of economy and metamorphosis shall plead greater attractions,—and when other incitements shall cede the palm to those which embrace the intelligent principle and functional discipline.

Sir John Lubbock has recorded in the 'Journal of the Linnean Society' (May, 1875, No. 69) various interesting experiments in continuation of his "Observations on Bees, Wasps, and Ants;" tending to show that bees "do not communicate with their sisters even if they find an untenanted comb full of honey,"—that, far from exhibiting "any evidence of affection, they appear to be

* 'The Cycles of Entomology,' by J. W. Douglas (Ent. Mo. Mag., Sept. 1875, p. 89).

† 'Introduction to Entomology,' iv. p. 390 (5th edit.)

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callous and utterly indifferent to one another,"—that even "their devotion to their queen is of a most limited character,"—and that their perception of differences of colour is incontestable,—a deduction equally applicable to wasps.

Some experiments were also made "with the view of ascertaining whether the same bees act as sentinels." Having found that particular scents had the effect of calling the bees out, he marked twelve, in all, of those which first appeared on several successive days; and, in nine such experiments, "out of ninety-seven bees which came out first, no less than seventy-one were marked ones."

He likewise tested some of the faculties attributed to ants, and especially their "power of communicating facts to one another," which his first recited experiments served to corroborate; although "some appeared to communicate more freely with their friends than others," which did not summon their companions to assist them.

By a further series of "Observations" on these races, more recently read before the Linnean Society, and communicated by the author to 'Nature' (No. 315, Nov. 11), we are also informed that one ant made no less than 187 journeys in a day to carry off larvæ one by one, without bringing any other ant to assist her; but, in other instances, a different result was witnessed, the ants which had the heaviest task to perform having "brought far more friends to their assistance than those which had apparently only two or three larvæ to remove,"—these latter being replaced by others from time to time as each was carried off. Thus, "of thirty ants which were observed, those placed to a large number of larvæ brought 250 friends, while those placed to two or three larvæ under similar circumstances only brought eighty."

We also find that ants prefer a beaten track, however circuitous, to hazarding a short cut by dropping even "one-tenth of an inch;" but had retreat been cut off altogether, their ingenuity to devise some other mode of escape might have been more sorely tested.

In these and other experiments upon the aforesaid social tribes, the most striking evidence is afforded of the indefatigable industry with which such observations have been closely followed up from early morn to "dewy eve," and recorded with a precision rarely if ever surpassed; thus affording an admirable illustration how time may be stolen, as it were, for such objects, from other vocations, by activity and perseverance.

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An interesting account of the habits and metamorphoses of a new species of Sitaris (S. Colletes), parasitic, as its name implies, on a species of Colletes (C. succincta, *L.*), has been given by M. Valéry Mayet in the 'Annales' of the French Entomological Society (Ser. 5, tome v., 1875), with two plates exhibiting the various stages of both these insects, from larva to imago; and of Epeolus tristis, *Sm.*, obtained from the cells of this Colletes.

The primitive larva of the aforesaid Sitaris, as carefully described and delineated in this memoir, is furnished with *triunguiculate* tarsal claws, like that of Meloë; whereas, in M. Fabre's remarkable life-history of Sitaris humeralis, the tarsi of the latter, in this stage, are represented as terminating in a single powerful claw (*un ongle puissant, long, aigu, et très mobile*).*

The young larva of S. Colletes is supplied with a caudal apparatus (*appareil fixateur*, V. M.), consisting of two upcurved spiked appendages attached to the base of the eighth abdominal segment on the dorsal region, having a simultaneous action up and down, between which are two tubular processes emanating from a superincumbent plate and directed backwards, from whence filaments issue from time to time when the larva desires to affix itself to a hair of the bee or other object. Fabre, however, appears to consider such filaments, in the larva of S. humeralis, as ordinary caudal setæ, which he describes as attached to the exterior margin of the ninth abdominal segment (*l. c.*, p. 310).

The Colletes-egg is readily accessible to the young Sitaris, not being deposited by the bee, as in the cells of Anthophora, upon the honey-store itself, but affixed above this to the wall of the cell, whereby the difficulty and danger to be incurred in reaching the same, and the necessity of effecting this manœuvre at the moment of oviposition, are avoided.

As this Colletes constructs her cells and deposits her eggs in the autumn, the Sitaris-larvæ, soon after their birth, attach themselves to their victims, instead of remaining, like those of S. humeralis, seven months fasting in suspense, from the end of September to the end of April, waiting for the Anthophoræ to emerge from their hybernacula.

When more than one of these larvæ occupy the same cell of the Colletes, they fight with great ferocity until one alone remains, the others being killed and thrown into the honey; although it not

* Ann. Sc. Nat., 4e Sér. (Zool.), tome vii., 1857, p. 310; pl. 17, fig. 2.

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unfrequently happens that even the victor in this strife, finding the egg partially consumed by one of his former adversaries, and consequently insufficient for his maintenance, shares the fate of the vanquished; but no such pugnacious dispositions are evinced at other times when consorting together in multitudes. Such contests are avoided in the cells of Anthophora, where a single Sitaris-larva obtains possession of the egg unmolested at the moment of oviposition on the honey itself—a circumstance upon which M. Fabre comments as a wonderful display of instinct on the part of these larvæ (*l. c.*, p. 326).

The secondary larva of Sitaris Colletes which plunges into the honey, continues to feed thereon until April or May of the following year. It is destitute of eyes or ocelli, but still retains the vestiges of legs, and is furnished with spoon-shaped mandibles, acting alternately in the feeding-process. Eight or ten days after ceasing to feed, the adult larva assumes the pseudo-chrysalis stage of corneous consistency, within the detached but still closely enveloping larval pellicle, which Fabre aptly compares to a bag of fine gauze.

M. Valéry Mayet designates this stage as the "*pseudo-nymphe*" —an appellation which he incorrectly attributes to Newport; for the latter, in his several memoirs on the transformations of Meloë (Linn. Trans., vols. xx., xxi.), always speaks of the "adult or *pseudo-larva*,"—referred to in his last memoir as the only intermediate stage in which he had found this insect (*l. c.*, p. 177),—for which stage M. Fabre has substituted the more appropriate denomination of "*pseudo-chrysalide*" (p. 356), as not giving birth at once to the imago form, but evolving, within the indurated tegument, a semi-active larval form, followed by an ecdysis of the latter preparatory to assuming the condition of a true pupa or nymph (p. 338). Neither he nor Newport ever allude to a *pseudo-pupa* or *pseudo-nymph*, applicable rather to the aforesaid semi-active stage, which Fabre was the first to notice, and which, from its close resemblance to the antecedent larva, he designates as "*la troisième larve*."

The pseudo-chrysalis of Sitaris Colletes exhibits this interior metamorphosis—as seen through the semi-transparent corneous tegument—after about ten weeks, towards the end of July or the middle of August; the perfect beetle emerging usually the following month; although in some rare instances—attributable,

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as M. Valéry Mayet conceives, to insufficient nutriment in the primitive stage, when the Colletes-egg has been partially tapped by other competitors—the ultimate metamorphosis is protracted until the autumn of the following year.

In Sitaris humeralis, however, such retardation is the general rule; it being only in exceptional cases that some of these remain scarcely more than a single month in the pseudo-chrysalis state, completing their metamorphoses in August and emerging shortly after. But they usually *hybernate* in the former stage; and it is only in June of the second year that the interior quasi-larval form is separated from the pseudo-puparium, and about five weeks later becomes transformed to a true *pupa-nymph*—the same month, in fact, when the adult larva had assumed its corneous tegument in the previous year (Fabre, *l. c.*, p. 339—343). M. Valéry Mayet recognises this pupa as "*la véritable nymphe*" (p. 75); therefore the antecedent stage, or "*troisième larve*" of Fabre—and not his "*pseudo-chrysalide*"—can alone constitute the *pseudo-pupa* or "*pseudo-nymphe*."

Thus the Sitaris humeralis usually requires two years to complete its metamorphoses, hybernating the first year in the primitive larval condition, and the second in that of the pseudo-chrysalis; whereas the Sitaris Colletes, commencing its operations seven months earlier, generally attains maturity within a single year.

The early transformations of two other species of Meloïdæ have also been investigated by M. Jules Lichtenstein, of Montpellier, who succeeded in nurturing one of the primitive larvæ of Meloë cicatricosus on the egg of a Vespa vulgaris placed upon honey in a glass tube, and in witnessing its first metamorphosis five days later, when it plunged into the honey, but died after feeding thereon twelve days.

This secondary form differed essentially from that of Meloë described and figured by Fabre, apparently constituting an intermediate stage, closely resembling the antecedent larva, but destitute of caudal setæ, with lacteous head and black eyes (the subsequent stage being blind), looking like a minute salamander with its legs distended on the honey.

Experiments were also tried with the primitive larvæ of the blister-beetle (*Cantharis vesicatoria*), which could not be induced to feed on the eggs of Vespa or Polistes, nor on simple honey, beyond a few feeble attempts; but eventually they accepted the

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honey-bag of the hive-bee as an available substitute for their ordinary food, affixing themselves to this and thriving thereon. In one instance also a compound of honey and young Polistes larvæ proved equally successful.

These primitive larvæ are of a brownish black colour, with the second and third thoracical and the first abdominal segments more or less pallid, having the usual long caudal setæ and triunguiculate tarsal claws. After the lapse of nine days they changed to the secondary form as aforesaid. Three of these attained the third stage, having still well-developed legs (*pattes assez bien conformées*), but with no indication of eyes, coinciding in this respect with those of Meloë and Sitaris.* After a time, becoming restless as adults, they were placed upon some earth, wherein they hastily buried themselves, for the supposed purpose of completing their transformations, but contrary, as it would seem, to their accustomed habits. Here they appear to have perished, being no longer discoverable; their death being attributed to insufficient moisture.

From the localities frequented by this Cantharis, where the burrows of Halicti also abound, M. Lichtenstein considers it probable that the larvæ of the former are reared in the cells of these bees; but, in such case, they could not quit those abodes to undergo their ultimate metamorphoses in the earth.

Our attention has been called to a new trap-door spider from South Africa, which forms its nest in the bark of trees, recently described and figured by the Rev. O. P. Cambridge in the 'Annals and Magazine of Natural History' (November), under the name of Moggridgea Dyeri.

The nests, however, figured by Mr. Pickard Cambridge, differ essentially from two which were exhibited at the July meeting of this Society; these being wholly imbedded in the solid bark, and having a hinged lid closely resembling the surrounding parts of the cuticle itself, as if retained *in situ*; whereas, according to a fuller description of the nests submitted to Mr. Pickard Cambridge—published in the 'Field' newspaper of the 28th August—they were stated to "consist of a silken tube, scarcely more than an inch in length, rugged on the outside in such parts as may be

* Fabre, *l.c.*, p. 334 (S. humeralis); p. 354 (Meloë). Valéry Mayet, *l.c.*, p. 74 (S. Colletes).

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exposed, and formed in the folds and interstices of the rough bark ('Annals and Magazine,' *l. c.*, pl. x., fig. A),—the outer side of the lid, like that of the exposed parts of the tube, exactly resembling the surrounding surface of the bark." One of these tubes was "constructed in the channelled groove of a piece of wood which had apparently formed part of some building" (*l. c.*, fig. B).

Other nests somewhat similar to those referred to by Mr. Pickard Cambridge were exhibited by M. Lucas at a meeting of the French Entomological Society (Nov. 10); the silken tubes—carefully concealed by, and interwoven with, particles of bark—constituting a longitudinal distension above the surface and ceding to pressure. No reference, however, has been made in any of these descriptions to tubes entirely hidden within the solid bark, having only the lid exposed.

From the occupants of these novel abodes being destitute of the spines with which the anterior extremity of the falces is crested in allied races, assisting them to burrow in the earth, Mr. Pickard Cambridge considers that these spiders, "not being furnished with the necessary implements," fix "upon a position where excavation is needless." But in the other instances referred to, where the tunnel is equally short, scarcely penetrating beyond an inch, and not corresponding therefore with that of any wood-boring larva of similar dimensions, the fortuitous discovery of such a retreat would seem open to question; the fangs being possibly more available than the spines on the falces for operating upon the fibrous tissues, and an economy of labour being effected by utilising any convenient receptacle, as frequently witnessed among other excavators.

Some doubts have been entertained whether the access to these domiciles is from above or from below. Mr. Pickard Cambridge now inclines to the opinion that the lid is placed at the upper extremity of the tube as usual, although evidence is wanting upon this point.

An instructive account of the habits of this and other allied species, comprising also the preliminary details published in the 'Field,' has been given in 'Newman's Entomologist' for November last by the talented Editor of that periodical.

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Physiology.

The remarkable insects collected at Kerguelen's Island, and exhibited at one of our meetings by the Rev. A. E. Eaton, the Naturalist attached to the Transit of Venus Expedition to that locality, have since been described in the 'Entomologist's Monthly Magazine,'—the Diptera, together with a single Lepidopterous specimen, allied to the Gelechiidæ, by Mr. Eaton; the Coleoptera, by Mr. C. O. Waterhouse.

These insects, mostly apterous, or furnished with rudimentary wings (one of the Diptera, to which the name of Anatalanta aptera has been assigned, having neither wings nor halteres), coincide in this respect with many of those of the Madeira Fauna described by Mr. Wollaston in his 'Insecta Maderensia;' for which a plausible explanation has been afforded in the circumstances which impede the use of such organs in these exposed insular abodes. A Report by Mr. Eaton has also been published in the Proceedings of the Royal Society.

An elaborate Essay by M. Félix Plateau, Professor of the University at Gand, on the Phenomena of Digestion among Insects, has appeared in the 'Memoires de l'Académie Royale des Sciences, des Lettres et des Beaux-arts de Belgique' (Tome, xli. 1874), wherein many interesting facts elicited by his researches are related; an abstract of which, compiled by the author, is given in the 'Annals and Magazine of Natural History' (August, 1875).

Dr. Müller has recently published a paper* in the 'Bienen Zeitung' (July 2), whereof a summary appears in 'Nature' (No. 314, Nov. 4), to which a sequel is promised hereafter; wherein he treats of various groups of hymenopterous insects, "in which we find a series of forms presenting more and more complex life-relations, accompanied by a higher and higher mental organisation;" the consideration of which gradations he considers "calculated to throw much light on the question—How has the honey-bee acquired its remarkable instincts?"

* Dr. Müller's memoir appears to have been, in some respects, founded upon Lepeletier de Saint-Fargeau's long-exploded classification in relation to "*les habitudes morales*," given in the 'Suites à Buffon' (Hyménoptères, i., pp. 81—89).

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Commencing with the Tenthredinidæ, as "amongst the lowest of Hymenoptera," exhibiting the simplest instincts in their mode of oviposition on the plant upon which they themselves subsist; he passes on to the Cynipidæ, where we meet with a new mode of life, their incision giving rise to the well-known galls; after which, proceeding to the "insect-piercing species," he considers that "this passage from phytophagous to carnivorous habits has not only led to the formation of many new species, but also to a greater complexity in the relation of the parents to their young, and to a higher intellectual development, which is shown especially in the arrangements made for the nourishment of the larvæ; since it requires both greater energy and more intelligence to discover and attack a particular species of insect than merely to lay an egg on the plant which has served the mother herself for nourishment," the passage from the one to the other having, as he conceives, "been slow and gradual;" and, "on the basis of this increased energy, intelligence, and adaptability," a still further advance was made by other groups, which, to secure their eggs from molestation, transport their victims to a place of security, involving certain difficulties with which many may have found it impossible to cope. "Thus the ovipositor of the Tenthredo became the sting of the wasp; and thus those species which carried off their victim to a place of concealment would abandon the habit of laying their eggs inside the victim."

But the Tenthredinidæ can in nowise be regarded as inferior in intellectual capacity to the Cynipidæ, which exercise no constructive ingenuity in the production of their gall-tenements, as exhibited by some of the former in the weaving of their reticulated cocoons and other artistic performances; while the admirable construction of their double-saws, whose "various modifications might furnish ideas for improved mechanical instruments,"* their multicellular wings, and, in some instances, highly developed furcate and pectinate antennæ (Schyzocerus male, Lophyrus male) stamp them as infinitely superior in structural organisation to the Cynipidæ. Yet the natural affinities of these respective families prescribe their relative sequence and precedence in inverse ratio to their faculties and endowments.

As regards the "insect-piercing species," their restrictive action

* Westwood, Introd. Mod. Classif., vol. ii., 94. Kirby and Spence, Introd. to Entom., vol. iv., p. 160 (5th Edition).

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being diffused over a vast extent of insect-life, as compensating influences against excessive fecundity, a multitude of these, distributed throughout the whole range, serves to maintain due equilibrium on either side; which is oracularly interpreted as having "led to the formation of many new species:" but this group consists of several very distinct races, the Ichneumonidæ, especially those consorting with the Aculeate tribes, being conspicuously superior in energy and intellectual development to the Chalcididæ, next in succession, reputed higher in the scale of structural organisation and affinity.

With respect to the further advance from the ovipositor to the sting, the non-existence of the first-mentioned instrument necessarily involves *external* deposition of the egg, with all the concomitant requirements of protection for the latter in a closed cell, and provision for the future progeny; but Dr. Müller would have us believe that, contrary to all analogy, some of the aforesaid "insect-piercing" races "carried off their victim to a place of concealment," and were thus led to abandon the habit of laying their eggs "*inside* the victim," when (as it would seem) *still furnished with the terebra*, whose presence or absence must necessarily determine, *ipso facto*, the mode of oviposition with its accessories; this organ, however (as we are taught), becoming converted into a sting by "slow and gradual" degrees, while, of course, in the active and essential exercise of its appropriate functions as an ovipositor, or otherwise not a single generation of these reforming groups, now become industrious constructors and purveyors, could have survived such transitional period! *

Moreover, it is not to the sting alone, but to the whole structural development, that such contrasts extend; comprising, *inter*

* Dr. Dewitz has lately shown that "the sting is distinguished in a remarkable manner from the ovipositor of the grasshoppers, by the number, as well as by the attachment, of the muscles which move these apparatus. * * * The differences arise, above all, from the dimensions, the forms, and the adherences of homologous parts; and particularly from the different relations which the sheaths of the sting, and the upper sheaths in Locusta, bear to the other parts."—("On the Structure and Development of the Sting and Ovipositor of some Hymenoptera and of Locusta viridissima." By Dr. H. Dewitz—'Zeitschr. für wiss. Zool.,' 1875. Transl., 'Ann. and Mag. Nat. Hist., No. xcii., Aug., 1875, p. 154.)

Saint-Fargeau says of the sting—"*Il ne sert qu'à déposer dans la plaie qu'il fait un acide plus ou moins actif, et n'a aucun rapport avec les parties de la génération; tandis que la tarière de la première section* (Terebrantes, *Latr.*) *est la prolongation extérieure de l'oviductus*" (loc. cit., p. 3, note).

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alia, peculiar differences in the venation of the wings, corresponding among species allied in other respects, but having no functional advantage in the conservation of the race according to the modification theory; such characteristic exponents, in this and other orders, symbolizing the members of each kindred association with remarkable precision, and serving, coincidently with other indications, to determine their otherwise natural alliances. Nor can it be averred that the relative expansion of wing or velocity of flight offer any solution of these diversities in the alary system; for the Tenthredinidæ, with their dilated wings and complex venation, are among the most sluggish of these races; while the Oxyuri, the Chrysididæ, and some of the Fossores, less amply endowed in these respects, are eminently prone to energy and vivacity.

Dr. Müller, however, eventually demolishes his own superstructure, of progressive acquirements as a reliable principle of continuous advance to "more and more complex life-relations, accompanied by a higher and higher mental organization," by finally expressing his "opinion that the various proceedings by which the solitary wasps thus protect their young against contingencies to which the insect-piercing species are liable, must have at first been arrived at with a consciousness of the object to be effected, but that they have gradually become instinctive, and are now unconsciously inherited from generation to generation."

Thus the "increased energy, intelligence, and adaptability," which he adduces in the first instance as the "basis" of such advances made with a conscious object, have gradually lapsed into a retrograde stage of degenerate unconsciousness of purpose, merging into the more familiar phases of hereditary habit; although, as he subjoins, "it is impossible to watch a wasp at work without feeling that, with these inherited customs, or so-called instinct, much individual effort also comes into play."

We have yet to wait for his ulterior comments on the instincts of the honey-bee, which, by a parity of reasoning, must be considered to emanate from conscious intellectual antecedents, since degraded to unconscious inheritance.

Meanwhile another athlete, Dr. Anton Dohrn, has sprung up to contest the palm in a new arena, having published a pamphlet* wherein he maintains the principle of universal degradation and

* 'Unsprung der Werbelthiere und Princip des Functionswechsels.'

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retrogressive development, as opposed to, and entitled to supersede that of, universal progress!

"Who shall decide when doctors disagree?"

Nomenclature.

Mr. Arnold Lewis has revived the discussion of "Entomological Nomenclature and the Rule of Priority," in an elaborate treatise published as an Appendix to the first volume of our Transactions for 1875; wherein he dilates, with much cogency of argument, on the propriety of maintaining the principle of established usage, in contradistinction to the practice which has obtained, in some quarters, of superseding universally accepted names by others of earlier date but questionable accuracy, considered synonymous therewith, but long since obsolete, and in the conjectural application of which the apostles of this creed frequently and widely disagree.

The serious complications ensuing from such innovations are indisputable; and the rule of priority, however excellent and essential as originally applied in a limited sense to obviate confusion, has been stretched to an extent which could hardly have been anticipated, tending rather to augment than diminish this evil, by introducing perplexing elements conflicting with time-honoured accord.

Uniformity being the great desideratum, and the substitution of antiquated names, of doubtful attributions, for others of established repute, being a gratuitous infliction involving disastrous consequences, any measure tending to promote the one and counteract the other must be hailed as a step in the right direction.

The proposed remedy suggests that "a stand-point" should be fixed—say from 1842, when the rule of priority was laid down by the British Association, or any other preferable date which should preclude contested references to anterior epochs—and to regard the names universally recognised at such period as irrevocably permanent; respecting the law of priority as applicable to those questionable at the time and subsequently, but depriving that law of retroactive effect as regards others. Such at least would seem to be the purport of the projected scheme.

There are, however, many abstruse questions affecting principles of nomenclature which are continually occurring, and to which it

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may be no less desirable to direct attention. Dr. Puton, in noticing some of these anomalies on a recent occasion (Petites Nouv., 120, 121), adverts to a principle which has been advocated, that all are bound to make use of reason and good sense in these and other matters; but Mr. Arnold Lewis emphatically objects to the exercise of such discretionary authority *ad libitum* as a reliable precept, which must inevitably leave the door open to every possible latitude of interpretation according to the views of particular individuals, thereby leading to perpetual inconsistencies and interminable disagreement; although the evil is comparatively a minor one to that of the elasticity of the present law of priority, for which, as he contends, nothing but a new enactment can adequately provide, by conferring the *right* to retain the names in use.

It must be acknowledged that Mr. Arnold Lewis has done good service in setting forth some of the preposterous results of the present system, and in recording the opinions of many eminent authorities in reference thereto; but he touches very lightly upon the means whereby such authoritative restrictions should be determined, which, to be effectual, should be accepted as equally binding upon all. General acquiescence, however, will, he conceives, be readily attainable, as governed by considerations of expediency, and by a consciousness of the "real boon" which such a measure would confer.

A curious illustration of the value of presumed dates under the priority law is afforded by the anachronism which appears in the recently published 'Statistique' of the Macro-Lepidoptera of 'Eure et Loire,' by our honorary member, M. Achille Guenée, whose volume, issued in 1875, has a title-page of the year 1867, with a preface of 1866! In this work, M. Guenée discards synonymy altogether; his principle being, as he states, to give to each species the most ancient and best-known author's name, and that which he conceives should be definitively adopted.

Fossil Entomology.

Mr. Henry Woodward, F.R.S., has read a paper before the Geological Society, wherein he describes two new fossil species of Macrurous Crustacea belonging to the genera Callianassa and Mecocheirus, the former obtained from the Kimmeridge clay of

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the Sub-Wealden Boring, the latter from the same clay of Boulogne-sur-Mer; also a new fossil crab, belonging to the genus Harpactocarcinus, from the tertiary formation of New Zealand, discovered by Dr. Hector, F.R.S., Director of the Geological Survey of that Island.

Mr. Woodward has likewise described a remarkable fossil orthopterous insect, from the English coal-measures, exhibited by him at the Geological Section of the British Association on the occasion of its last meeting at Bristol, which, from the venation of the wings and other characters, he considers to be related to the Mantidæ, and for which he proposes the name of Lithomantis carbonarius. Also a fossil scorpion from the same coal-measures, which he refers to the genus Euscorpius, and which he proposes to name E. Anglicus.

An important Memoir on 'Fossil Butterflies,' by Mr. Samuel Scudder, comprising all that has been hitherto recorded upon this subject by text or illustration, has been published by the American Association for the Advancement of Science, at Salem, Mass., 1875.

M. Preudhomme de Borre has more recently described and figured, in the 'Annales' of the Belgian Entomological Society (fasc. ii., 1875; pl. v., vi.), a remarkable fossil wing found in the carboniferous schist at Mons, and attributed to a lepidopterous insect allied to the genus Attacus, which he has named Breyeria Borinensis. Mr. Scudder, however, demurs to the character ascribed to this wing, furnished with transverse reticulations; while, in his opinion, differing also essentially in venation from the aforesaid type (Compt. R. Soc. Ent. Belg., Jan. 8, 1876).

New Publications, Memoirs, &c.

Our Transactions for the past year—consisting of four Parts, illustrated by nine Plates—comprise the following Memoirs:—

In Myriapoda:—Description of a new Species of Sphæridium from the Borders of Mongolia, by Mr. A. G. Butler.

In Coleoptera:—Descriptions of new Endomychici, by the Rev. H. S. Gorham (two papers); of new Genera and Species of Phytophaga, by Mr. Joseph S. Baly; of Lamellicorns from Japan, by C. O. Waterhouse; also of the male of Alcimus dilatatus (Scarabæidæ); of new Genera and Species from Australia, pl. iii.; and of Heteromera (Helopidæ), chiefly from Terra del Fuego, by

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the same; of a new Species of Prosopocœlus (Lucanidæ), by Major F. J. Sydney Parry; of new Genera and Species of Heteromera, pl. vi., vii., by Professor Westwood; also of Rutelidæ inhabiting Eastern Asia and the Islands of the Malayan Archipelago, pl. viii.; of a new Genus of Cleridæ (comprising seven new species) from the last-mentioned region, pl. ix.; and of a new Species of Lucanidæ, with a note on Lissotes obtusatus, by the same author.

Professor Hermann Burmeister, of Buenos Ayres, has also described a new Coleopterous Genus belonging to the Family Scaritidæ, found on tbe shore of the River Uruguay, which he has dedicated to Professor Westwood, under the name of Obadius insignis.

In Neuroptera:—On the Neuropterous Fauna of Japan (excluding Odonata and Trichoptera), by Mr. R. McLachlan.

In Hymenoptera:—Descriptions of new Indian Aculeate Species, pl. i., by Mr. Frederick Smith; and of new Species belonging to the Genus Nomia, pl. ii., by the same; also of other new Species belonging to this Genus of Short-tongued Bees, pl. iv., v., by Professor Westwood.

In Lepidoptera:—Contributions towards a Knowledge of the Rhopalocera of Australia, by Mr. A. G. Butler; and a List of the Lepidoptera referable to the Genus Hypsa of Walker's List, with Descriptions of new Genera and Species, by the same author.

In Hemiptera:—Synopsis of British Hemiptera-Heteroptera, Parts I. and II., by Mr. Edward Saunders.

The Supplementary Part of our Transactions for 1874 also appeared in March last, accompanied by four Plates belonging to Memoirs of that year.

The considerable number of new species of the remarkable genus Nomia, described in the three papers aforesaid, by Mr. Frederick Smith and Professor Westwood, deserves special notice; forty-five hitherto unrecorded species of that genus having thus been added to the list by the former, and sixteen more by the latter, many of these being admirably figured in the accompanying Plates; and the peculiar structural diversities exhibited in the legs of the males being carefully delineated in numerous other instances. These notable Memoirs constitute a valuable addition to our 'Transactions' of the year, and their juxtaposition in the same volume is a felicitous coincidence. Many remarkable

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Coleoptera have also been described and figured in the other papers by Professor Westwood.

Mr. Smith has elsewhere called attention to the fallacies of Dr. Kriechbaumer's method of killing and preparing hymenopterous insects for the cabinet; while vindicating his own mode of proceeding, infinitely superior in its results and far less complicated. The attention of all students of this Order may be advantageously directed to the system advocated by Mr. Smith.*

Two parts of the second series of the 'Transactions of the Linnean Society,' section 'Zoology,' have been published—to be separated henceforth from the Botanical portion, as in their 'Journal of Proceedings;'—the first of which contains a paper "On some Atlantic Crustacea from the Challenger Expedition," by the late Dr. v. Willemoes-Suhm; with descriptions of several blind deep-sea species, including a remarkable Astacus (A. Zaleucus) taken near Sombrero Island, W. I., in 450 fathoms, "one of the claws of which is developed to an extraordinary extent." This paper is illustrated by eight plates (tab. vi.—xiii.).

Descriptions of two new species of Crustacea from New Zealand, by Captain F. W. Hutton; a paper on the Genus Bathyporeia, by the Rev. Thomas R. R. Stebbing; another paper on some new exotic Sessile-eyed Crustaceans, by the same; a paper on the Genus Deidamia, by Mr. James Wood Mason; and one on some new or undescribed species of Crustacea from the Samoa Islands, by Mr. Edw. J. Miers, have appeared in the 'Annals and Magazine of Natural History.'

"A Collection of the Arachnological Writings of Professor Nicholas Marcellus Hentz," under the title of "The Spiders of the United States," has recently been published in a connected form among the 'Occasional Papers' of the Boston Society of Natural History (vol. ii., 1875), illustrated by twenty-one elaborate plates; these papers having originally appeared from time to time, extending over a long series of years, in the 'Proceedings' of that Society and in some other publications. They are now supplemented with a considerable number of notes, descriptions and synonymical remarks, by Mr. J. H. Emerton and by Mr. W. E. Holden, together with two new plates. Many highly interesting observations on the habits of these spiders are dispersed throughout the series.

* *Vide* Ent. M. Mag., Aug., p. 62.

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M. Eugène Simon has published the second volume of his 'Arachnides de France,' containing descriptions of a large number of new species and of some new genera.

The Rev. O. P. Cambridge has described many new species of Erigone in the 'Illustrated Proceedings of the Zoological Society' (parts 1, 2, 3); also a new species of Lophistius, in the British Museum, from Penang; some new and rare British spiders; and three new curious forms of Arachnida, in the 'Annals and Magazine of Natural History.'

Mr. A. G. Butler has also described some new species of spiders from Queensland, in the 'Cistula Entomologica' (pars xii., pl. x.); and others from New Caledonia, Madagascar and Réunion, have been described in the aforesaid publication of the Zoological Society, by Dr. Thorell (part 2, pl. xxv.).

A formidable species of stridulating Mygale, from Assam, has been described by Mr. Wood Mason in the 'Proceedings of the Asiatic Society of Bengal' (November, 1875), under the name of M. stridulans. This faculty of emitting powerful chirping sounds is common to both sexes, which are furnished alike with a kind of comb within the jaws, presenting a number of chitinous elastic teeth, acted upon by a denticulate scraper on the exterior region of the cheliceræ.

We are indebted to Mr. F. P. Pascoe for several papers in the 'Annals and Magazine of Natural History,' consisting of notes and descriptions of new genera and species of Longicornia (pl. viii., January); of new Asiatic species of Rhynchites (June); of new Australian Curculionidæ (pl. i., July); and of new genera and species of Coleoptera from New Zealand (pl. v., September).

Descriptions of new species of Eumorphus and Corynomalus, by the Rev. H. S. Gorham; of Trigoneurus, and of exotic Hydrophilidæ, by Dr. Sharp; of Coleoptera from Morocco, by Messrs. H. W. Bates and T. V. Wollaston; of Longicornia from South America, by Mr. W. H. Bates; of Prionidæ, by the same; of exotic Phytophaga, by Mr. J. S. Baly; and of three new Anisotomidæ (from Scotland, Siberia and Algiers), by Mr. E. C. Rye; have likewise appeared in the 'Entomologist's Monthly Magazine.'

Mr. C. O. Waterhouse has described several new genera and species of Coleoptera from South Africa, Madagascar, Mauritius, and the Seychelles, in the 'Annals and Magazine of Natural

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History' (June, 1875). Also some new Rutelidæ, in the 'Cistula Entomologica' (pars xii.); some new species of Myodites and Rhipidius (*ibid.*); and some new Heteromera, with synonymical notes (*ibid.*, pars xiv.).

In the same publication we likewise meet with descriptions of three South-American Cetoniidæ, by Mr. Oliver E. Janson (pars xii.); a Reply to Criticisms on the 'Trichopterygia Illustrata,' by the Rev. A. Matthews (pars xiv.); descriptions of Australian Phytophaga, by Mr. Joseph S. Baly (*ibid.*); the description of a new species of the Leucanoid genus Cantharolethrus, by Major F. J. Sidney Parry (*ibid.*); and some notes on the same genus, with descriptions of the female of C. Luxerii, by Mr. C. O. Waterhouse (*ibid.*, pars xii.).

The third and concluding portion of the Curculionidæ collected by Mr. George Lewis in Japan, have been described in the 'Annales' of the Belgian Entomological Society (fasc. ii., 1875), by M. W. Roelofs; and the Scolytidæ, by MM. Chapuis and Eichhoff. An extensive Monograph of the Onitidæ, by M. J. Van Lansberge, occupies the preceding fascicule of the same 'Annales.'

Dr. Sharp has described some new genera and species of Longicornia from Australia, in the 'Révue et Mag. de Zool.' (Nos. 1, 2, 1875).

A Monographic List of the Genus Plusiotis (Rutelidæ) of America north of Panama, with descriptions of new species, by M. Adolphe Boucard, has also been published in the 'Proceedings of the Zoological Society' (part 2, pl. xxiii.).

The second and third parts of Mr. Robert M'Lachlan's 'Monographic Revision of the Trichoptera of the European Fauna,' containing a continuation of the Limnophilidæ, have been issued, with numerous plates of structural details admirably delineated.

Some "Notes on Odonata from Newfoundland," by the Baron E. de Selys-Longchamps, are published in the 'Entomologist's Monthly Magazine.'

A series of papers containing "Descriptions of Oak-Galls" (with illustrations), translated from Dr. Mayr's work on this subject; and others from Dr. Snellen van Vollenhoven's "Life-histories of Sawflies;" have been for some time in the course of publication in various numbers of 'Newman's Entomologist.'

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Mr. Hewitson's admirable work on 'Exotic Butterflies' continues to maintain its high reputation, appearing with its usual regularity, and having now nearly reached its centenary, No. 97 having been published on the 1st of this month. Various papers by the same author, containing descriptions of new species from different localities, have appeared in the 'Entomologist's Monthly Magazine.'

In the same publication we also meet with descriptions of new species of Brassolinæ from Bogotà, by Mr. W. L. Distant; of Diurnal Lepidoptera from Newfoundland, by Mr. H. W. Bates; of Japanese Rhopalocera, by the Rev. R. P. Murray; and of others from Central Africa, by Mr. Herbert Druce. A paper by the latter on the Diurnal Lepidoptera of Angola, with descriptions of some new species, has also appeared in the 'Illustrated Proceedings of the Zoological Society' (part 3); and descriptions of new Asiatic Lepidoptera, by Mr. Frederic Moore, are comprised in the concluding part of the same 'Proceedings' for the previous year (pl. lxvi., lxvii.).

Various new species of Diurnal Lepidoptera have also been described in the 'Cistula Entomologica' (pars xii.), by Mr. Herbert Druce; and a review of Dr. Boisduval's 'Monographie des Agaristidées,' by Mr. W. F. Kirby, appears in the same publication (*ibid.*); as well as "Remarks on the Synonymy of the Atlas of the Heterocerous Sphingidæ and Noctuidæ of the Voyage of the Frigate 'Novara';" by Mr. R. H. Stretch, of San Francisco (pars xiv.).

Mr. W. H. Edwards has published parts 2 and 3 of the second series of his 'Butterflies of North America,' each containing five coloured plates.

We have to thank Mr. A. G. Butler for supplying, with his customary zeal and energy, a long list of memoirs in this Order, comprising (in addition to those in our Transactions, already referred to) the following:—In the 'Annals and Magazine of Natural History,' Notes on certain Genera of Agaristidæ, with Descriptions of new Species (pl. xiii., February); of Butterflies from Tropical America (March); of Lepidoptera from Central America (May); of new Genera and Species in the Collection of the British Museum (June); a Revision of the Subfamily Pericopiinæ of the Family Arctiidæ, with Descriptions of new Species (September); of two new Species of Arctiidæ (*ibid.*); and of new

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Genera and Species of Lepidoptera from South Africa (December). Also, in the 'Illustrated Proceedings of the Zoological Society,' Descriptions of thirty-three new or little-known Sphingidæ in the Collection of the British Museum (part 1, pl. i., ii.); of four new species of Protogonius (*ibid.*, pl. v.); of other new Species of Sphingidæ (part 2, pl. xxxvi., xxxvii.); and of Indian Heterocerous Lepidoptera (part 3). Likewise, in the 'Cistula Entomologica,' a Revision of the Genus Spilosoma and the allied Groups of the Family Arctiidæ (pars xiv.). And, in the 'Entomologist's Monthly Magazine,'—Notes on Mr. Scudder's "Historical Sketch of the Generic Names proposed for Butterflies" (June); and a Revision of the Genus Eusemia, with Descriptions of new Species (October).

We are further indebted to Mr. Butler for descriptions of three new Species of Homopterous Insects in the 'Proceedings of the Zoological Society' (part 4, 1874); and for a List of the Species of the Homopterous Genus Hemisphœrius, with Descriptions of new Species in the Collection of the British Museum ('Ann. Nat. Hist.,' Aug., 1875).

M. Signoret has concluded his exhaustive Mémoire on the Coccidæ, in seventeen parts, the latter portion (14—17) having appeared in the 'Annales' of the French Entomological Society during the past year, leaving only some supplementary notes and general tables to be appended thereto.

A posthumous Monograph by Dr. F. X. Fieber on the European Cicadinæ occupies several recent parts of the 'Révue et Mag. de Zoologie.'

Dr. Puton has published a second edition of his Catalogue of the Hemiptera-Heteroptera of Europe and the Mediterranean Basin, with considerable additions, comprising also the Homoptera.

Various papers on British Hemiptera-Heteroptera and -Homoptera, by Messrs. Douglas and Scott, have also appeared in the 'Entomologist's Monthly Magazine.'

Professor Westwood has likewise communicated to the same periodical (April) the description of a new Pulicideous insect from Ceylon (Sarcopsyllus gallinaceus), which attacks the domestic fowl, attaching itself firmly by its rostrum in considerable numbers around the eyes and neck, whereof specimens were exhibited at one of our meetings (June).

Papers on the arrangement of the British Anthomyiidæ, by

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Mr. R. H. Meade; on Asphondylia Ulicis, by Mr. G. H. Verrall; and Notes on the British Dolichopodidæ, with Descriptions of new Species, by the same; are also published in the aforesaid 'Magazine.'

Some Contributions to the Diptera of New Zealand, by Mr. A. G. Butler, have also appeared in the 'Cistula Entomologica' (pars xii.).

Another volume of the 'Zoological Record,' under the Editorship of Mr. E. C. Rye, has been issued during the year.

In concluding these remarks, I would venture to turn, for a few moments only, from the past to the future; and, on vacating the honourable position in which your suffrages have placed me during the last biennium, it is a subject of happy augury to us all that this Chair will be so worthily filled by my distinguished predecessor and successor, Professor Westwood, whose name possesses a prestige of imperishable fame, which must constitute a centre of attraction to all Entomologists at home, and re-establish the influence of his presiding genius in the estimation of the world.

If our metropolitan brethren should thus be brought to recognise the obvious benefits which must accrue to all alike by concentrating their energies to a common focus, the efficiency and value of united action would be proportionally extended thereby; while the accumulated resources of bygone years which our bibliographical stores now present, would prove of inestimable advantage to all who join us.

A vote of thanks was given to the President and other officers for their services, especially to the Treasurer (Mr. McLachlan) and the Librarian (Mr. Janson) on retirement from their offices.

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Abstract of Treasurer's Account for 1875.

Receipts.	£	s.	d.	Payments.	£	s.	d.
Balance brought from last Account	0	8	7	Rent, Librarian and Office Expenses	94	2	8
Arrears of Subscriptions received in 1875	11	11	0	Printing	116	11	10
154 Subscriptions for 1875	161	14	0	Plates—Engraving & Printing	24	1	0
8 Admission Fees	16	16	0	Books purchased and Binding	5	2	6
2 Compositions	31	10	0	Tea, &c., 12 Meetings	12	0	0
Tea Subscriptions	17	18	6	Compositions invested	31	10	0
Sale of Publications	90	5	9	Balance in Treasurer's hands	63	3	11
Dividend on £215 3*s.* 2*d.* Consols	5	18	1				
Special Donation from W. D. Robinson-Douglas, Esq.	10	10	0				
	£346	11	11		£346	11	11

Audited and found correct,

J. Jenner Weir.
W. C. Boyd.
W. Cole.
Samuel Stevens.
J. W. Dunning.

January 14, 1876.

Assets of the Society.

	£	s.	d.
Arrears of Subscriptions considered good	24	3	0
Cost of £215 3*s.* 2*d.* 3 ℔ Cent. Consols	198	14	0
Cash Balance in hand	63	3	11
	£286	0	11

R. M'LACHLAN, *Treasurer.*

London, January 14, 1876.

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APPENDIX.

On Entomological Nomenclature, and the Rule of Priority.

By W. Arnold Lewis, F.L.S.

[Read 1st February, 1875.]

Since last the subject of Nomenclature came before us, a great deal has been done. The movement in favour of retaining universally accepted names, which originated at one of our meetings, has received efficient support in widely different quarters. One prominent entomologist on the Continent of Europe has declared himself free from obedience to the rule of priority; another in the New World has replied to the proposed changes of names that his motto is "*Resist innovation;*" while at the present time the entomologists who are his fellow-countrymen are formally re-considering the laws of Nomenclature at the instance of those who support the reform in question. The discussion has covered many pages; and the same reasoning which was put forward here has occupied large numbers who have shown an interest in the subject. The author of one of the chief synonymic lists has come forward to render explanations of some points urged against the observance of the strict priority rule, and based on discrepancies apparent from his own important work. From the signs which appear, it is high tide now on this question. The arguments have reached an advanced stage; yet I think there is reason to fear that some who have expressed themselves as adverse to the restoration of forgotten names, have nevertheless failed to seize an essential point, and are in danger of missing the object aimed at. For taking up the thread again, reviewing some part of what has been said and done, and making clear the questions in dispute,—for pointing out (I venture also to hope) some considerations which are of importance,—the present appears a fitting time. With these objects at all events, I offer the remarks which are to follow.

Now what are the main points relied on by those who desire the preservation of names in use? I think they can be taken up successively in such a manner as to make them clear to everyone.

The Meaning of the Rule of Priority.

In the first place, we ask those interested in the discussion to examine with us the circumstances under which the laws of

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our Nomenclature were made, with a view to the inquiry what meaning the Rule of Priority was intended to bear.

Linné, who invented Nomenclature, and Fabricius, who first formulated rules for Entomological Nomenclature, did not invent, and never heard of a rule of priority. Linné and Fabricius were very far from being guided by priority; and, as is well known to every investigator, both of them changed names as and when they chose. For some forty years after the death of Linné, a general principle of priority seems never to have occurred to anyone; that is to say, all the writers who described species in the infancy of our science did so before "priority" was born or thought of. On the one hand, then, they disregarded no law when they "re-named" a species; and on the other hand, they did not pen their descriptions in any reliance on a rule which, in their time, had no existence. Thus they were in no respect wrongdoers; but neither had their work the sanction of the law, which otherwise it might plausibly be urged we should be wrong now to modify to their disadvantage. This fact will supply some useful considerations when we come to consider the element of "justice" to the first nomenclator. The authors who gave specific names under no law of priority, were, besides Linné and Fabricius, De Geer, Poda, Scopoli, Schoeffer, Hufnagel, Schrank, Fuessly, Sulzer, Cramer, Stoll, Knoch, Esper, Engramelle, Scriba, and Borkhausen; and all from whose works the disused names are to-day being disinterred.

Latrellle is credited with originating the *principle* of maintaining the prior name, and the proposal appears to have been made shortly previous to 1825. The proposal, when he made it, came as a perfect novelty, for the reception which it met with shows plainly that "priority" was a strange thing to all. Dejean, who at this period commenced his descriptive work on the whole of the *Coleoptera*,* takes notice of the new suggestion only to scout it, and (thus early in the bibliography of the science) declares himself as deciding questions of nomenclature on the principle of upholding names generally employed. In 1834, Lacordaire wrote an essay† of an elaborate character, in which he set himself to prove that to endeavour to decide the priority of names was from the infirmities of the old descriptions impossible and a mere waste of time; and he summed up his arguments in one objection, that the plan was completely and radically "impracticable in the application." In these noteworthy observations he was warmly supported by Silbermann;‡ and I think there is little doubt about the fact that Lacordaire had the suffrages of entomologists. Although the principle had been started some twenty years before, I believe it is the fact that until the British Association Rules of 1842, "priority" to intents and purposes remained a theory. Only

* Species Général (1825), vol. i. p. x.
† Silb. Revue, vol. iv. 233.
‡ Silb. Revue, vol. iv. 241.

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in 1840 Boisduval published the second edition of his "Index Methodicus," in which he expressly declined to supersede names in use by names which had been forgotten.*

What was the state of things here in 1842? Entomological science, though not still in its infancy, was yet receiving the attention of a limited number. The movement which has since made entomology the most popular of all the sciences was, however, near its birth. Stephens' "Illustrations" and Curtis' "British Entomology" were (so far as they ever were) one quite, the other nearly, completed; but neither do those authors communicate any information on the state of development which entomology had attained in other countries, nor does it appear to have been the case that English naturalists (whether authors or readers) had any knowledge worth speaking about on the subject. England, however, was the country which had the deepest interest in securing an uniform nomenclature. The position of isolation, which to-day remains as a geographical fact alone, was in 1842 a real separation from community in study and language, in entomology as in everything else. The countries of the Continent rubbed along together, but if English naturalists were to be *au courant* with the state of science, or (vulgarly speaking) were to have a finger in the pie at all, it was imperative that they and the naturalists of the Continent should use the same nomenclature. What difficulties met them at the outset? Here is the well-known description in the language of Mr. Strickland:—

"If an English zoologist visits the museums and converses with the professors of France, he finds that their *scientific* language is almost as foreign to him as their *vernacular*. Almost every specimen which he examines is labelled by a title which is unknown to him, and he feels that nothing short of a continued residence in that country can make him conversant with her science. If he proceeds thence to Germany and Russia he is again at a loss; bewildered everywhere amidst the confusion of nomenclature, he returns in surprise to his own country and to the museums and books to which he is accustomed."

These facts being recognized, the English naturalists set themselves to find the remedy. There was little doubt that in the majority of cases where the English names differed from the Continental names the former were wrong. The British Association† appointed a committee, and the committee (adopt-

* Index Methodicus, 2nd ed. vi.

I have discovered in the Entom. Mag. vol. i. p. 225 (1833), the phrase "the now universally received law of priority;" but the writer's wish was, it would seem, father to the thought. Instances to the contrary might be multiplied; it is worth while to mention Denny's Monographia Anoplurorum Britanniæ, published *in* 1842. An inspection of this work seems to show that the author could never have heard of "priority" at all.

† The meeting in 1842 was held at Manchester. The rules are sometimes called the Manchester Rules.

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ing the principle of priority as the basis) drew up rules which had for their first result the suppression of hundreds of names in use in this country, and in this country alone.

The object, then, of the British Association Rules was to reconcile the nomenclature of England and the Continent. The need to be supplied was agreement on scientific names *in the cases where the authors in use differed.* I take this point to be clear, partly from the surrounding circumstances at which we have glanced, and no less so from the interpretation which the rule of priority for many years on all hands received.

It would appear not to have occurred to those who framed the priority rule that neither the names in use on the Continent nor the names in use here should be correct; and in this confidence they unsuspectingly formulated their Rule I., that "the name originally given by the describer of a species should be permanently retained to the exclusion of all subsequent synonyms." For a period of years the rule received the interpretation which (as above indicated) it seems certain that it was meant to bear. The construction of it to mean that the earliest discoverable name shall be adopted to the displacement of all names in use, never, I believe, originated in this country, but has been caught up, as it seems, by some English entomologists from those on the Continent who had invented that construction. It is quite unbelievable that for twenty years the priority rule enacted by the British Association was *misunderstood* in the country where it originated, and where those who took part in framing it were continuing their scientific labours.

The Position since the Rule of Priority was made.

But let us suppose that by the law of 1842 it was intended to enact that the earliest discoverable name should supersede all others. Well, the originators of the law had not the advantages which we have. In the first place, their agreement was come to in comparative private. There was no endeavour to take into the account the practical students who might be conversant with special aspects of the case; and, as a bald fact, the matter received no sort of public discussion, of which all may satisfy themselves by searching the magazines and journals circulating at the time. I rest no especial weight on this circumstance; it is a good thing that naturalists of eminence were found to agree on a solution of the difficulty which was sadly wanted, and which did effect a practical settlement of our nomenclature. But I should omit an important consideration if I were to miss pointing out the great difference between 1842 and 1875.

In 1842 the domain of entomology appears to have been parted out on something of the feudal pattern; and the followers of Curtis and Stephens respectively were not only well content

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to acquiesce in, but eager to further, the ascendancy of one or the other of these leaders. I have once before quoted Mr. Stainton's words on "the extreme seclusion" in which our entomologists lived. "Except a few of the leaders,"* he says, "literally no one knew anything." It is a fair argument which should give offence to no one, that a rule imposed when our science was in this obscured condition may well be open to review to-day, when a very large class of entomologists is, as I at least will assert, competent to form a sound and independent judgment on this matter.

But, with these reservations left aside, it must never be overlooked that we are viewing this question in the light of the *fresh experience* of more than a generation, and a generation, moreover, which has surpassed in results—and consequently been more prolific of experience than—the whole preceding period. The legislators of 1842 had made the discovery that the names employed here were different from those employed elsewhere, and they enacted a rule to cure the evil. The discovery which we in our turn have recently made is, it seems to me, as fresh a matter as that which opened the eyes of those who promoted the rules. We discovered between three and four years ago that the bare rule of priority (as construed now) has let in practices which promote and do not dissipate confusion. I put this as a discovery, and that word implies that in my judgment the truth of it is established. The main point, indeed, I rely on not as as a prophecy or a predilection, but as a fact. But we have at present to consider a little further the historical aspect of the case.

In 1845, the British Association Rule was adopted by the American Association of Geologists and Naturalists. They seem to have merely "followed suit," and I think we are well justified in assuming (what appears to be confirmed by the present position of the question in America) that the rule of priority in America meant whatever it meant in Europe—no more and no less.

Naturalists who confined their attention to the British Fauna had little temptation to concern themselves with foreign books; they would have had to pick out the British species from a crowd of non-British. The central European Fauna is, however, in no respect limited by political boundaries, and the descriptive work which dealt with German insects answered pretty well for French. To the interchange of communication and common circulation of some descriptive works it is to be attributed that the position of nomenclature on the Continent gave less trouble than did ours; and to this circumstance in turn it may be owing that no rules for nomenclature were made on the Continent until many years later. By the year 1858, however, many on the Continent awakened to the circumstance

* Ent. Weekly Intelligencer, vol. v. p. 113.

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that disagreements on nomenclature had arisen. In 1857 M. Guenée issued the last volume of the Species Général des Lépidoptères, in which work he undoubtedly brought forward some names unwelcome to the entomologists of Germany. Whatever the cause may have been, the German entomologists in 1858 called a Congress to establish rules for nomenclature. It duly met at Dresden, and its rules* were shortly afterwards published.

There is one great difference between the Manchester rules and the Dresden rules, and it is not a little instructive to remark it. The framers of our rules no doubt had before them only the object of reconciling the prevailing disagreements. The object of those who framed the Dresden rules, however, was to supply a standard of perfect accuracy, and the laws which they framed they intended not only to be of permanent authority, but also to comprehend all the aspects of the questions. Those who took part in the Congress were fully awake to the circumstance that names in use everywhere might be "wrong," for they had had some recent experience of the fact. How did they deal with the case? They first agreed in enacting "priority," in much the same language as our own rule; but by another rule, passed at the same time, they provided—what? "*The principle of preserving the oldest of the names given to the same insect is not absolute; the choice between them, following the greater or less degree of convenience, remains free.*" Where entomologists had an eye to the point that no name in use might be the "prior" one, it is striking that the decision arrived at was—not the imperative acceptance of the prior name—but that the choice between the names should follow "the greater or less degree of *convenience*."

We are coming to consider wrong and right, and it is not beside the question to recall that this code of rules is in operation in Germany at the present moment, while nevertheless it is from Germany that we are visited with the systematic intrusion of the first name on strict "priority" grounds. The very writers to whom we must attribute a familiarity with the Dresden code are the most unsparing in throwing all "degrees of convenience" to the winds, and even (it must be said) treating with derision those who have all the time this statute in their justification.

Immediately on the publication of the Dresden code, the Entomological Society of France had the matter before it, and M. Amyot, who took a leading part in the discussions which followed, formulated a set of rules.† It is only important to quote the one which provides that "*usage may consecrate injustices in the priority of names.*" There is no code drawn

* Berlin. Ent. Zeitsch, vol. ii. app.

† Ann. Soc. Ent. France, 3rd ser. vol. vii. 606.

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up by a committee (so far as I am aware) in operation in France, but a translation of the Dresden code was printed and distributed with their Proceedings by the Entomological Society of France and the Entomological Society of Lyon.

The next important event after the Dresden code of 1858 was Dr. Staudinger's Catalogue of 1861, which I (in common with others) take as the starting-point of the modern objectionable practices. Before this, forgotten names had been here and there brought up in their monographs by different entomologists, and on no system in particular. *Nemo repente fit turpissimus;* I do not say Staudinger commenced all of a sudden a practice totally unheard of. But Staudinger's 1861 Catalogue was the first example of the resurrectionary literature which has since become familiar. It is striking to find this work published at Dresden in only the third year after the promulgation of the code.

From 1861 to 1871 the tide went in the direction of restoring the earliest discoverable names. It is sufficient to mention the names of Gemminger and von Harold, the late Mr. Crotch, Mr. Scudder, and Mr. Kirby to recall that the practice of "resurrection" resulted in the production of several volumes. In 1865 the British Association appointed a committee, which enacted with some slight alterations the rules of 1842 over again. These 1865 rules, however, were not the justification of practices which commenced in 1861, and it is well known that no reconsideration of the priority rule took place. The attention of the framers of the rules was given to the settlement of certain minor details.

If, however, the case had been otherwise, and we had to look upon the rules of 1865 as confirming "priority" pure and simple, which from the known opinions of some who took part in framing them we should be wrong in doing, yet the consideration remains that 1865 was too early to see this subject as it now is. Gemminger and von Harold were yet to publish their Munich Catalogue (not to mention other Coleopterological lists which had not then seen the light). Staudinger and Wocke's second Catalogue was yet to gild the fine gold of their first edition, and this work, with Mr. Kirby's Catalogue of Diurnal Lepidoptera, had not then proved how the early descriptions baffle the operation of "priority." Especially was it not then discovered that the early nomenclature itself is less contradictory and discordant than the commentaries and practice of editors of catalogues and other writers on synonymy. For it has only recently become apparent that the same reasons which make one author accept a name as "prior" make another reject it, and that this action on opposite or conflicting principles is producing irretrievable injury to the stability of our nomenclature. The question could never before be seen in the light in which now we see it, and such reasons have of late years

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become operative in one direction, that there is a pressing necessity, as we urge, for a re-settlement of the priority rule in the interests of our science at large.

The Principle which regulates Nomenclature is Convenience; and Convenience requires that Accord shall be upheld.

Having glanced at the historical side of the question let me proceed to the next points. We invite those interested to consider with us the principle in dispute, and to join us in investigating one question of fact.

In recent years entomologists have set themselves to work to discover the earliest name for every species, for this has been the practice, as we have seen, of writers from 1861 to 1871. In the words of one * authority "a generation arose who knew nothing of, or overlooked the circumstances connected with its original proposal, and who took the letter of the rule as their guide. And gradually there has sprung up a class of authors who have devoted themselves with enthusiasm to exploring ancient works and forgotten publications of all sorts in the hunt for the earliest recorded name to every species by which to replace the name or names in use." As another † writer remarks, "A little band of so-called reformers discovered the law and talked it over and gave it another meaning. They said, 'This shows us that we ought to investigate every name and see if we cannot find another and older name.' They went at it tooth and nail, and changed every name that could be changed for another name."

What I may term the general argument put forward on the undesirability of this practice has not, I submit, been met with a satisfactory answer. I refer to that embodied in the axiom *Communis error facit jus*. Although the literature of this controversy has now grown to a considerable bulk, I conceive that the argument founded upon convenience and expediency remains as strong as (if it has not grown stronger than) it was when first put forward. Rather early in its history, the maxim had to encounter the opposition of those who misconstrued *communis;* more recently it has had to meet a criticism founded upon a fancy rendering of *jus*. It may therefore be worth while to expound the meaning which I give to this apparently troublesome aphorism. As to what it does *not* mean, "*communis error*" signifies "a mistake which is universal," and not "a vulgar error." *Jus* simply means "legal right," and that is all about it. The English of the maxim therefore is that "An error which is universal makes the legal right." I apply the maxim to the solemn question of nomen-

* Mr. Edwards; Canadian Ent. vol. v. p. 22.
† Mr. Newman; Zoologist, 2nd ser. 2877.

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clature in this sense; that there are cases where it may be we are in error in using a given name as the first name, but in those instances where we are all in the same error, right is done. The maxim does great credit to its inventor, who showed his sympathy with a just and natural human sentiment, at the same time that he threw into a proverb the ***modus vivendi*** which controls every one of us in daily life. In matters of positive enactment (*not* of course of scientific truth), what all, whether rightly or wrongly, are agreed on, is the law; and I should have supposed this did not call for much explanation. There are enthusiasts who from time to time work their way into courts of justice who cannot, I grant, be prevailed on to acknowledge this axiom. They, I doubt not, would press on you the opinion that the unanimous consent which they encounter is a universal error in favour of their opponents and against themselves. To such the reply may be applicable: "To please you we will say we are wrong; but we are all equally wrong together. At all events we are *agreed.*"

Some pretty phrases (which certainly caused amusement if nothing else) found their way into print,* about the very essence of the studies of the naturalist being "the exposure and obliteration of error," and that there could, "in an *exact* science, be no 'common error.'" It certainly can never have occurred to some that there is a profound difference between facts in natural science, towards which men, after infinite study, occupy the position of mere learners, and the trumpery bye-laws of naturalists. When there was a universal agreement that the sun moved round the earth, I agree that it was necessary to abandon the universal error. The name of the Clouded Yellow butterfly is a matter on which universal agreement makes the right. The notion of an eternal right and wrong about the names of bugs appears to me a misconception; and the allusion to "exact science" defeats me still as much as ever.

The law of priority is a means to an end, and the end in this case is accord or common agreement on a name. If you have agreement on a name, and that agreement can be made secure and permanent, you have already that which the law was designed to provide. The object of the law is the important thing; not the law, which is only machinery. Then, if all names, save one for a species, are obsolete, you *are* enjoying agreement on the name. What is wanted you have; better off you cannot be, and the most that can be done is to disestablish an accepted name in favour of one which at best has to fight for its position. One complaint therefore against those who insist on subverting accord by "priority" is that they put the means above the end sought.

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* Entom. Monthly Mag. vol. viii. 41.

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Accord on a name is not to be desired, as I shall take it, on principles of eternal truth; but it is imperatively necessary on the score of *convenience*. Those who use the names are men and not machines; the subject they have to deal with is enormously vast, and cannot be called easy; life is short. Cross purposes about names, and the trouble necessary to clear up or avoid them, are a serious matter for those who have their hands full already; but that is a small part of it. If names are continually changed, inter-communication is embarrassed, and the work of others becomes available only at a ruinous sacrifice of time and labour, which may frequently have the result of making an important work a closed book. Convenience cannot of course be paramount to the direct advantage of science, and if that could become an element in the discussion convenience would take the second place. But, as the case stands, there will be few who do not hold with me that convenience is the be-all and end-all of nomenclature.

I said just now that "if agreement on a name can be made *secure and permanent*," you have already that which the law of priority was designed to provide. If the agreement be not permanent it is illusory; and the only way in which it can be made permanent is by establishing it on a principle. Although, therefore, convenience is, I say, the be-all and end-all of nomenclature, it is none the less necessary to have a strict law. I argue that convenience requires that *accord* shall be upheld. The law to be aimed at, then, is a law to protect and render permanent names which are everywhere in use.

From the very first of the discussion this was the ground taken up. The independent assertion of wishes and predilections has formed no part of the battle. Where the object sought *ex concessis* is agreement, to stand wilfully on an original tack defeats the object; and the evils of this very course (and the hopeless prospect of agreement which it holds out) have been sufficiently dwelt upon. Those who have favoured the proposal which I put forward have done so on a principle which was plainly stated.

Being conscious of all this, I think those who have agreed with me have some reason to complain that Dr. Sharp has considered himself entitled to write of them as he has done. When undertaking a review of the question I should be wrong in passing by without notice his "Object and Method of Zoological Nomenclature," for several reasons. Dr. Sharp, after mentioning the evidence of identification which has to be collected, observes*:—"This will undoubtedly be a slow process, but it will be a sure one; and I may remind the impatient ones, who proclaim that we must have a way of settling such things right off, that they are, if they have any just voice in this matter, men of science as well as collectors, and, as such, they

* Object and Method of Zoological Nomenclature, pp. 31, 32.

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will readily appreciate the association of the words 'ohne hast' with 'ohne rast.' Let them recollect that in these disputed points we wish to obtain a decision that shall be absolute, and not one that may be reversed on the first appeal. To enable us to do this, we must in each case carefully collect the evidence, and consider it under the light of reasonable and admitted principles."

Dr. Sharp must decide for himself how far Candèze, Leconte, Westwood, Wallace, Bates, Edwards and others (with whose names I can supply him from the list of "the impatient ones") merit the appellation of "men of science." That, however, is his matter. I am content to speak as one of the "collectors," and therefore desire explicitly to assert that everyone, who comes forward with coherent reasons, has "a just voice in this matter;" and the reasons which he may adduce, be they bad or good, are (it seems to me) not vanquished by terming their sponsor "an impatient one," nor even by charging that he "proclaims we must have a way of settling things right off." It is pretty evident from the rest of the passage that Dr. Sharp has never made himself adequately acquainted with the tenets of those he was addressing in this peculiar vein. The proposal to which Dr. Sharp alludes was and is founded on principle and supported by reasons; and to my surprise I find that Dr. Sharp's answer amounts to the statement that he thinks differently. That is scarcely, as I submit to entomologists, a good foundation for comments like the one just quoted, which have a strong family likeness to an avowal that those of Dr. Sharp's opinion are men of science, and those of the contrary opinion something different. I venture to think that when the reasoning on which they rely has been demolished, it will be time for Dr. Sharp to indulge in the inquiry whether those who meet him in argument are "men of science." While their reasoning remains unassailed, that seems little relevant to the matter under discussion.

The Oldest Descriptions are unrecognizable.

Having endeavoured to point out that the movement—being based on the sober and strictly-defined principle of convenience upholding accord—does not owe its birth to "impatience" or frolics of any description, I pass on to the question of fact which must be satisfactorily settled before we can do good by these discussions.

Having to bring forward the oldest name that they could find, entomologists searched the oldest books in which to find it. Their task was to see what insects the names in those books represented. From the way these old books are sometimes regarded, one could understand anybody who was innocent of all acquaintance with them, contracting the notion that they are grand old works, containing stores of valuable facts,

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with sterling descriptions of species, original and masterly and systematic. The old books do not all merit this description. Perhaps, to avoid misconception, it is better to say at once that they all merit a different description. Let us start with this, that the knowledge of species which those writers possessed was restricted to comparatively a limited number in the case of each. When the author had but a small number before him for description, he would use only such of the characters of the species as served to distinguish each of them from others then known to him; and the better describer he was the more certain he would be to do it. But what use can now be made of descriptions so drawn up? This objection speaks for itself, and the truth of it must be plain to every one. So simple a matter did the "differentiation" of species at first appear, that the whole description was the insect's name. All the characters which separated a species from all others were conveyed in its name alone! The specific name (nomen specificum) in Linné's earlier works was, as has been clearly pointed out, "what to-day is called diagnosis."* This afterwards had to be discontinued, but a few Latin words (more often than not falling short of three lines of print), formed the usual "Linnean description" of a species. As to the extent of this objection: Linné described but 780 Lepidopterous insects, the number now known cannot be less than 30,000. Dozens of allied species all equally fit numbers of the old descriptions; and such descriptions are now necessarily of no value. On this ground alone, an enormously large proportion of the oldest descriptions are at the present day *unrecognizable*; and, since the discussion began, declarations have come from all sides establishing what I venture to consider is the agreement of entomologists on that point.

The discovery, however, is a very old one indeed, and appeared in print more than sixty years ago, from which it appears that the oldest descriptions became strictly unrecognizable very soon indeed after they were written. Schönherr even (1810) remarks † on "the incomprehensible and little available descriptions of the older writers." Lacordaire ‡ (1834) remarked that Linné and Fabricius were at that day "unintelligible without tradition." In the time of J. F. Stephens § "confusion arose primarily from the difficulty there was of ascertaining the first name given, from the description being so vague and indefinite as to preclude the possibility of accurately determining the species intended." M. Reiche has affirmed ‖ that if the rule rejecting tradition were taken *au sérieux* the

* Hagen, Can. Ent. vol. vi. p. 165.
† Synon. Insect., pref. iii.
‡ Silb. Revue, vol. iv. 234.
§ Stephens' Cat. British Insects, p. iii.
‖ Ann. Soc. Ent. France, 3rd ser. vol. vii. 609.

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Linnean and even the Fabrician species "would have to disappear from our nomenclature." Von Harold insists* that the greater part of Linné's, Scopoli's and Fabricius' descriptions, with others of the same period, are "plainly and beyond question insufficient for identification," and "fail entirely to differentiate the species." "Who," he demands, "is in such a position that he can with certainty point out in the works of Linné, Herbst or Fabricius, anything more than that a given beetle is a *Harpalus*, a *Haltica*, a *Nitidula*," etc.? Dr. Staudinger agrees† that "names given by the old authors belong to such and such species only by a sort of tradition." Mr. Edwards remarks‡:—"The old authors had described but a few hundred species, and their descriptions were of the briefest. How brief an average example from Linnæus will show—'*Papilio Troilus;* wings tailed, black; fore wings with pale marginal spots, hind wings beneath with fulvous spots;' a description applicable perhaps to fifty species of Papilio."

It would only be overlaying the case to cite more instances after this "average example." A chief objection to restoring names attached to the oldest descriptions, then, is that as a body those descriptions are unrecognizable, and, in consequence, the names brought forward on the faith of them as a rule are of doubtful accuracy.

No person can demonstrate whether a given identification is wrong or right. Guesses decide the matter; and nothing can compel the list editors to make the same guess. Thereupon they make different guesses; you have a confusion that does not admit of being reconciled either by proof or persuasion.

The infirmity we have just been considering attaches to the best of the old descriptions, and for that matter will be found to attach in all probability to many of the descriptions published at the present day. Von Harold has this further passage§ on the point:—"A description absolutely sufficient, availing for all time, I hold generally, in the greatest number of cases, to be an impossibility; for one can never know beforehand what character or what individual distinction we shall perchance in the future depend on for distinguishing from some closely-related species one which first makes its appearance later, which we do not know in nature, but only from authors' description. Anyone who has occupied himself with drawing up analytical tables knows right well that separation of species often depends on this or that character, which in the best descriptions frequently remains unnoticed, so that such a species cannot be classified at all."

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* Coleopterologische Hefte, vi. pp. 45, 46.
† Cat. 1871, pref. xvi.
‡ Canadian Ent. vol. v. p. 23.
§ Coleopterologische Hefte, vi. p. 50.
See some similar observations by Professor Westwood in Mag. N. H. vol. ix. p. 561.

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The works of the old authors present other characteristics, which are important to be considered. Many of the old authors were very ignorant persons indeed, and the problem of species and variety was not less confounding to them than to others. Many described varieties of all shades as separate species; on the other hand they not unfrequently described two nearly allied species as one insect, and it is a common thing to find the list-writers who scrutinize these descriptions coming to different determinations on this account. There are some proved instances of those authors describing species from damaged examples, and endowing the species with characters due to old age or rough treatment of the specimen. Then (as I fear) the old writers were not all what we term "conscientious;" and many copied copiously from others. The comparative isolation in which each author flourished perhaps made detection unlikely; and one of these borrowers would appear not to have held before his mind the notion that a rule of priority in the future would pry out his failings on the score of doing justice to him as a nomenclator. To quote Mr. Edwards once more:—"Besides the brevity of the old descriptions, many are defective from other causes. Often the two sexes received different names; often varieties were described as species; often damaged and broken specimens were described as perfect, the defects being cured by imagination; often figures were made by unskilled artists who omitted the specific characteristics; or the figures were coloured so poorly as to be incapable of identification; or were copies from copies, or copies from memory; and often descriptions were made from unreliable figures instead of from the insect."

Mr. Edwards takes as an example of insufficient description the *Papilio Troilus*, Linné. I recommend the *Satyridæ* and *Lycænidæ* to any one who desires to satisfy himself what some of the old descriptions are good for. These are large groups, each with a strong superficial likeness among the species; both families contain a number of common European insects which lend themselves to observation; the ocellated spots on the wings furnish characters sufficient to produce a glorious *farrago* of confusion, which the old authors were not the men to miss. But whether the illustration be sought among the *Papilionidæ*, *Satyridæ* or *Lycænidæ*, or elsewhere, the thickest confusion is of course supplied in those groups which contain a number of closely-related species; and the genus *Limenitis* and its allies supply some instances which I shall advert to in another connection.

A solitary species like *Nemeobius Lucina*, for instance, which was not fairly open to be confused with others, has never as a fact had bestowed upon it any name but its own. In cases like this, synonymic list-writers have no service that they can do us.

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The fatality is that the cases where a change is made are, from the necessity of the thing, cases of a species which has many allies, and there one change most frequently necessitates several. It begins by some writer (whom the rest have followed) mis-identifying an original description and ascribing the name accompanying it to the wrong insect. This, of course, occurs most frequently where there is a real similarity which misleads. But the writer (whom the rest have followed) has most often not made one mistake of the kind alone. If he has taken species A. to be indicated by the description meant for B., he has of course ascribed some different name to B., which is thus also wrongly named; and the correction of the first error involves the correction of the second error as well. Very lucky are we, if it ends there. More frequently there is a much longer chain of "rectifications," each furnishing ground for fresh differences of opinion and consequently fresh confusion.

Small wonder that, under these conditions, Mr. Newman remarks that "the object of names is frustrated;" or that another writer makes the comment that "undertaken to make an end of confusion the synonymic lists have done nothing but augment it;"* or that a third (Mr. Edwards), after considering the facts as they are, should sum up the prospect in these words:—

"The result of all these efforts at stability, for that is the avowed object of the advocates of rigid priority of date, is extreme confusion, instead of the agreement hoped for when the code of the British Association was adopted, and students of one branch of entomology at least are at a loss to know where the nomenclature stands to-day, and are very certain that under the present order of things there will not be a name familiar to them that twenty or fifty years hence will not be supplanted under the claims of priority."

A fourth† has observed: "The rule of absolute priority, adopted as paramount law by a few investigators, has already brought about such a state of things, and alone is capable of continuing it . . . . Whatever the strict law of priority theoretically should accomplish, we have seen but the beginning of the permanent confusion in which its practice results, and which its continuance as the fundamental law will hand down to the remotest generation."

On questions of this kind it is well to give chapter and verse, and there is no authority, I presume, better than a very prominent descriptive writer who has paid much attention to synonomy.

Let me reproduce a few sentences selected from similar ones

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* Dr. Albert Breyer; Ann. Soc. Ent. Belg. vol. xiv.; pp. cxxxi, cxxxii.
† Mr. Mead; Canadian Ent., vol. v. 108, 109.

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in M. Guenée's Noctuélites.* Of *Scopoli*, writes M. Guenée:—"His method has very little of the natural about it; his descriptions are for the greater part unintelligible, and his names completely arbitrary or wrongly applied. This writer then we must take small account of; for the rest he is little consulted, and no one has followed him." Of *Schoeffer*, he says:—"His figures are as badly coloured as they are coarsely engraved, and in order to be recognizable had great need of the explanatory text of Panzer. Even with this addition his iconography is scarcely of any use save to clear up some passages of the ancient authors." Of *Fabricius* himself, M. Guenée writes:—"The greater part of the species do not possess the characters of their section, and the 380 *Noctuæ* which he has described are in reality thrown together without any order, and without any correlation between them. This makes the works of Fabricius an entirely unarranged repository, and much less useful than people have been accustomed to think it. You are obliged, in fact, to neglect a crowd of species which he created and named in visiting the different cabinets of Europe, because, after all the attention possible, you result almost always in uncertainty, or in finding over again a *Noctua* already given under other names." Of *Goeze*, M. Guenée remarks:—"His work is not original in any respect. The considerable time which this voluminous compilation required by no means finds any justification in the utility of the book, and it is much better worth while to have recourse to the same sources as the author than to follow him in his errors and repetitions."

Of *Esper*, M. Guenée says:—"This collection, extensive as it is, is at this day much neglected, and the work sells at an insignificant price, which must be attributed in the first place to the imperfect character of the figures, which are, in fact, the roughest for the age, and of which a certain quantity are unrecognizable . . . . As for the text, it is scarcely anything but one long compilation, to which is added a synonymy swelled by the diagnostical phrases, and sometimes by the old description of the authors whom he cites, but often applies wrongly. . . . Esper opened a disastrous road for science. I refer to the numerous varieties which he has figured as separate species, and to which he has given names which come forward to complicate our works without any use."

Of *De Villers*, M. Guenée says that "his additions to the "Systema Naturæ" might have been used if he had taken any care to assure himself at the outset, that the species he had before his eyes were really those of Linné; but he has sometimes committed in this respect the wildest mistakes, so that

* See the chapter entitled "Classification et Bibliographie des Noctuélites" in vol. i. pp. xlix—xc.

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we do not know at this day to what species his observations apply."

Of *Borkhausen*, M. Guenée writes:—"As to the specific portion it is very unequal. The descriptions of moderate length are faithful enough for the species which the author has seen in nature, but it is to be wished that all were in this position. Inspired by the desire to give a *complete* work Borkhausen took all the *Noctuæ* which appeared to be wanting in his collection from authors who had preceded him, and described them on trust. You can tell what a wonderful muddle was bound to result from this exploit; it is not rare in fact to find the same *Noctua* under two, three, and even four different names. Happily, it is pretty easy to distinguish these borrowed descriptions, though the author had not the frankness to acknowledge them; but this research renders very troublesome the study of his work, which owes to this circumstance as well as the imperfection of its plan the neglect into which it has fallen."

Of *Illiger*, M. Guenée remarks, that in discussing the synonymy of different authors, "Illiger has not always been any more accurate, and it would be difficult to say whether he has cleared up or mystified the most."

It would be tedious to prolong such quotations. The mere titles of some of the works disclose the circumstance that fugitive productions of several countries are bearing a part in overturning our nomenclature, being vouched for some obsolete names bestowed without any system and under circumstances which surely do not merit that points should be strained in their favour. M. Breyer has remarked that "*the greatest number* of these untimely changes came about from investigating or rather from bringing again into memory works without serious scientific merit."

Mr. M'Lachlan, to whom I probably do no wrong in styling him the most uncompromising of my opponents, agrees that the writers who bring up the old names "in their reverence for old names raise ghosts, not entities; in other words, they seek to overthrow names thoroughly substantiated to give place to others, nine-tenths of which have the merest shadow of a right to the superior position their admirers would allot to them—names that should sink into oblivion or rest quietly in the list of *species indeterminatæ*."*

* Entom. Monthly Mag. vol. viii. p. 40. See also Mon. Brit. Caddisflies; Trans. Ent. Soc. Lond. 3rd ser. vol. v. p. 2, note. [In "Trichoptera of the European Fauna," p. 100 (May, 1875), Mr. M'Lachlan remarks of "several not identified species of *Phryganea*, described by authors from the time of Linné up to 1830":—"It is just possible that some of these may hereafter be made clear, but for the majority I consider it hopeless and useless to indulge in speculations as to what may have been intended."]

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The works which have been mentioned and others such as those, it is said, must be ransacked and scrutinized with the object of disinterring the names found there, to replace the names in use! Now that we are fresh from examining a few of these books can we treat with gravity such a proposition as this? What could prompt the framers of any rules to set our entomologists to such House of Detention work? Have our most laborious writers nothing better to occupy themselves with than the puzzling out of these conundrums? What shadow of obligation is there that author after author should sharpen his wits to form a theory about the meaning of this or that third or fifth rate author's bad descriptions?

Things to me somewhat incomprehensible have been written on this point. It is said that "the existence of synonymy is too often owing to what are actual *crimes* against science," and that "when an entomologist describes an insect as new, without using every endeavour that is humanly possible to discover whether it be not already described, he commits one of the greatest crimes against science." I have elsewhere* described this language as of the high-falutin order, and must confess to experiencing some impatience at having soberly to reply to such declarations. Why should anybody be required to wade through "a chaos of blunders" before he is permitted to give to the world his own elucidations (or opinions for that matter) on a subject he may have investigated? Considering that this kind of *travaux forcés* has been in fact shunned by a crowd of prominent writers, I confess to further impatience when, at this time of day, "crimes" are constructed out of the practice which has been prevalent during all but the most recent period of modern entomological literature. The character of the old works has been examined; and before we censure those to whom we are beholden for the more modern (from which, in fact, we derive the degree of enlightenment we possess), for myself, at least, I should like to hear some good reason adduced. If every writer were forced to guess for himself the riddles provided for his entertainment by the first nomenclators, many would stop there and never get any further.

The Demand for "Justice" to the first Nomenclator cannot prevail.

Let me now pass on to take notice of an objection, viz., that if we deviate from absolute priority *per se*, we are wanting in "justice to the first nomenclator." At a very early stage of the controversy (in the course of some remarks published in the Entomologist's Monthly Magazine)† I said that, being an *ad populum* argument, I feared this might prove an influential

* Discussion of the Law of Priority in Entomological Nomenclature, p. 5, &c.

† Entom. Monthly Mag. vol. viii. pp. 1—5.

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one with many. The history of it shows how one may be mistaken in estimating the strong points of an adversary's case; for the argument, which made me anxious, is one which nearly all those who have come forward on the matter have agreed in condemning, and which, in two noteworthy instances, writers on the opposite side have repudiated. Amidst what I may term the chorus of agreement on this matter a discordant voice arises. Dr. Gray announces that the protest which has received the signatures of a majority of this Society "is decidedly against all proper treatment of our predecessors," and Mr. E. C. Rye apparently considers that, by quoting this statement, he can administer such a knock-down blow to all of us that he copies it out after his manner in the Entomologist's Annual for 1873.

Dr. Gray on this reason brings himself to the conclusion that the protest which we signed "can only have been put forward by mere butterfly collectors who have had no proper scientific training." It would not be worth while to take seriously what I believe to be a purely characteristic flourish; the more so as the list of names appended to the protest (which speaks for itself) was published in the same volume.* But I think we shall see before getting much farther how much this "justice to predecessors" is worth as an argument.

It seems necessary to observe that this is a matter on which one entomologist with a head on his shoulders is, when he knows the facts, as good a judge as another. The contrary notion, *i. e.*, that a strongly-worded phrase or two from an experienced entomologist can countervail good reasons adduced by an inexperienced amateur, may have arisen naturally enough out of the associations of years, but I submit will not bear examination. This is not a question of zoological science. If it were, some might perhaps hesitate before putting forward an opinion opposed, for instance, to Dr. Gray's. It is only because the influence of personal authority on such a point as this is of the lightest, that I do not vouch on the other side the names of entomologists who say the opposite. The number of those names is large, and their authority (on matters where authority has weight) is of the highest; but I shall not, on my part at least, turn aside to bring forward opinions merely as such. It may be that this question is eminently one which those who are not themselves nomenclators should take part in deciding; for circumstances, I think, show that those who have described species themselves may see these questions from a point of view which is not always that of entomologists at large. Authors alone, indeed, are little likely to arrive at a settlement; and most of them have works which make their writers tender on controversial points. However that may be, two or three

* See Ent. Annual, 1873, *ad finem.*

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sharp sentences from any quarter cannot influence the conclusion at which those who weigh the reasons may arrive.

The plea for "justice to predecessors" seems to be founded on the doctrine that the author who has first named an insect has a personal and individual right to have the name given by him retained. We are concerned with old authors; and I think we must be already satisfied that in upholding, regardless of consequences, a divine right in the first name-giver, we should be paying a reverence which would be somewhat laughable. It is entertaining for a little while to trace out the odd variety of accidents which combine sometimes to establish the names of the old authors. One author names a species (in one of the large genera) giving it an original name; that name had been hit on by some one else for a different species in the same genus (= group), which was not rare in times when gods and goddesses gave all the names to butterflies. The first nomenclator thus goes to the wall because his name is "*nom. præocc.*" A later author comes and mis-identifies his description with a different species altogether, which he accordingly publishes to the world; by this time the genus has been divided, and consequently the name destined for species A., and which was in error taken for species B., stands for species B., and not for the one to which it was originally given; the blunderer obtains immortality, and his friends importune us for "justice." This is by no means a rare kind of mistake, and there are many others quite as humorous. It constantly happens that a man's uprightness works his fall, but his backslidings put him on his legs again. But though sufficiently amusing, the subject is really very much beneath discussion. Although the old writers were most often little acquainted with what others had done, the works of Linné and Fabricius would appear to have fallen in the way of most of them. It is instructive to observe how the early writers themselves got on with the descriptions even of Linné; and I think we here reach a point in the discussion where we get a strong independent light on the facts, and our argument receives a good deal of assistance.

When Linné completed his labours he had (as we have said) described but 780 species of *Lepidoptera*, and of those a large portion were day-flying insects inhabiting Europe. Those who immediately succeeded Linné also described numbers of day-flying species inhabiting Europe. Now, investigation shows that these writers *then* ascribed the Linnean descriptions to widely-different species. Linné by no means described all the European day-flying *Lepidoptera;* but, perhaps, from a belief that he had done so, many of the writers who immediately succeeded him seem to have managed if possible to find somewhere in Linné's works the species they had under description. Thus when they had a butterfly with black wings and white markings on them they went, say, to the "Systema Naturæ" and

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promptly identified their insect. The Linnean description being made without a knowledge of allied species was vague enough to be applicable to the insect which the author referred it to. If one only of the authors did this, little confusion came out of it. But it frequently happened that several authors went independently, and respectively arrived at different identifications. At this point we are not dealing with inferences or opinions however distinguished or well supported, but with facts. Let any unprejudiced investigator examine the history of the following names (in the present genus *Colias*) *Edusa, Electra, Hyale, Helice, Chrysotheme, Myrmidone, Palæno, Europome;* (in the genus *Polyommatus*) *Alexis, Agestis, Icarus, Argus, Alsus, Thetis, Corydon, Meleager, Acis, Argiolus,* and any of the old species; (in the genus *Satyrus* and its allies) *Mæra, Pamphilus, Tithonus, Tiphon, Iphis, Alcyone, Actæa, Hero, Amyntas;* and do not let him leave off before he discovers cases where it seems old authors confounded a *Polyommatus* with a *Satyrus* (!!), so pleasantly comprehensive was the description of the "first nomenclator." The selection is pretty impartial, and will be found to illustrate several different authors.

It is the case that through all the very early literature of entomology many diagnoses of Linné and other describers of that date were found open to different interpretations. They were found thus vague by Linné's and the other writers' *immediate public.* What would be the attention paid to-day to descriptions which left it open to those who used them to apply the same one description to several different species? We should not wait long for the comment that the author's descriptions were "unrecognizable." These are, in truth, in the greater number of instances, descriptions no more of one species than of another (or many other) species; and this is not the discovery of some pert critic in our go-ahead era, but was a fact, experienced by those who were in part or altogether the writers' contemporaries, and a fact, moreover, productive within the span of a very few years, of the very confusion and disagreement which has continued ever since.

Perhaps, however, the truth is, the earliest descriptions were excellent, and those who came to opposite interpretations of them showed their incompetence? Well, if that line is the one to be taken, it illustrates the argument even better. If the entomologists who immediately succeeded Linné (who wrote, in fact, all the "old" books) were unable to read aright Linné's descriptions — when they were plain — is it the authority of *these* writers, and to preserve their work, that we are asked to do "justice" to the first nomenclator? And, in truth, I think that there is plenty of evidence that the fault lay on this side as much as on the other. On the one hand, the Linnean descriptions did often suit widely different species; on the other hand, his successors were very often wrong through their own

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mistakes. Linné's descriptions are vague; but they certainly did not always admit of being interpreted as his successors did interpret them. In those cases it was open to a later investigator to correct the wrong interpretation, and that has long ago been done; but in other cases where the successors of Linné came to different identifications, no one can say who was right. No one could say at the time, and what could not be decided at the time has generally not become any clearer since.

We are now on the consideration of "justice" to the nomenclator. I understand that phrase to mean giving to the nomenclator as much as he deserves, not to mean falling down and worshipping the oldest describers. The Ashantees, when they abase themselves before a fetish, (and subject themselves to a vast deal of inconvenience in the service,) no doubt consider they are doing "justice" to the fetish. That, however, only takes place while the fetish is credited with the possession of authority and other dignified attributes. When the course of events has convinced the devotee that his fetish is only remnants and rubbish, the Ashantee is reported to lose all respect for his fetish, and, indeed, to ignore him altogether. But the Ashantee is a barbarian of Africa,—and acts on principles essentially different from those of some entomologists in Europe.

Sweeping assertions are now-a-days always cavilled at; and, as my object is not to say things which excite cavil, the sweeping statement of fact which it is necessary to make shall be made in the language of an opponent. Baron von Harold thus characterizes the early literature of entomology:*—"The longer and more thoroughly that I occupy myself with the subject the more the conviction forces itself upon me that a good part of our nomenclature, in so far as it has reference to the literature of the end of the last and beginning of the present century, is nothing more than a protracted and fixed chaos of arbitrariness, inconsequences and blunders to the sifting and correct dealing which hardly had a beginning has been made."

It would be silly to enlarge on this, because it stands to reason. If the fact were not that the nomenclature of the end of the last century and the beginning of this century is a mass of blunders, an infinity of corrections, so-called, could not now be brought up. (I say "corrections so-called," for I dispute that it is possible satisfactorily to elucidate at the present time the points which have led astray for this long period author after author; and which have done so because the questions are in truth obscure.) Well, but it is the literature which we are asked to do "justice" to that is "a chaos of arbitrariness, inconsequences and blunders," for the *misunderstander* and the *misunderstood* make up together the band of "first nomenclators"! Justice does not go by guess-work; but who is now

* Coleopterologische Hefte, vi. p. 37.

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able to decide the right and wrong of these questions, and point out where the fault lay? Conjecture and speculation are the only resort; and conjecture and speculation (though we often have to act on them in other ways) have naught to do with claims for "justice," and justice has naught to do with them.

Justice implies the giving to each his due; and when each gets what he ought to have, we say that justice is done. I believe that systems of jurisprudence provide for the ascertainment of rights and also the due chastisement of offences; and it is a question whether the justice demanded should not be meted out under the latter branch. I never heard before the cry of "justice to our blunderers," and to me such a demand suggests retributive justice alone. There is such a thing as the *lex talionis*, but a fair compromise which leaves the old works undisturbed on the top shelves, will supply the best basis of settlement, least vexatious to the living, and likely to bring least into question the merits and demerits of the long departed.

Are we in doing "justice" to one person (be he the first nomenclator or the last), to be regardless of the injustice which we may do to other people? And are there not other people entitled to consideration? Which is the more important figure in science, the man who publishes stray descriptions, or he who masters the natural history of a group? We are on questions of sentiment, although the sentiment is of a good kind—the sentiment of respect to predecessors. Well, whose claims for "justice" present the stronger appeal? While the describer is as likely as not to be a man of small attainments, we have in the case of a monograph a guarantee that we are dealing with the work of one who, to some extent, must be a naturalist, and who comes to us with his title to respect made out. If it be the case (which I should regret to believe) that those who write books look for perpetuation of their memory in the names they bestow, then it seems to me that our sympathies should be enlisted on behalf of those who have done most for us. It comes to this: if we do not retain the names bestowed by the first describer it is because we *do* perpetuate the names bestowed by a monographer; while if we do not retain the names bestowed by a monographer, then (on the principle which is asserted) a quantity of the good work goes unrewarded. Wherever this is carried to the point of superseding names bestowed in a monograph for a name that is doubtful, most will agree with me that there is no "justice" at all in the case, but a flagrant injustice is committed. But, as I have already insisted, the cases where any names of the date we are considering can be brought forward which are not doubtful are either none at all or so exceedingly few that they do not materially affect the question. In nearly every case where a modern name is now superseded for an old one the case is one

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of doubt. The list-writers now seize on points of identification which a few years back all persons agreed were insufficient.

Another consideration remains with reference to the "justice" of the case. Some have dealt with this question as though authors were the only people concerned. I may be right or wrong, but I have grown up in the belief that authors do not write books for their own satisfaction or enlightenment, but to enlighten or satisfy other people. I have not yet learned that authors write to enlighten or satisfy other authors alone; for I believe they do not put out of view the large number of readers who are content themselves to publish nothing. Now, if the nomenclator has rights in the matter, so have other entomologists. To subject the whole entomological world to inconvenience and disgust without necessity is itself an "injustice" of a bad kind. I ask what we have done to deserve that our beautiful science should be made a battle-ground for the upholders of different fancy systems of synonymy? "Priority" has been aptly termed "a hobby." The bulb mania and the old china mania, and others, have their day; and there are fanciers in various departments which attract the notice of those who are blessed with leisure and have the special taste developed. But we have an interest in suppressing the fashion of synonymy-fancying; and I entertain the hope (which is brighter than it was) that this description of industry will soon not be worth following.

In parting from the subject of "justice to the nomenclator," I cannot pass by the trenchant writing of Dr. Leconte*:—

"It would seem from some expressions of opinion I have seen, but which I forbear to refer to more definitely, that there are those that believe that one main object of descriptive natural history is to give the authors a sort of proprietary interest in the species to which they affix names . . . Such ideas are really aspersions on the notions of the great professors of unremunerative labour, upon whom science chiefly depends for her advancement. The good and true labourers are many; the small and mean minds, who feel honoured at being quoted in synonymy, are few."

Again:—

"It is only in descriptive natural history, the lowest and most routine work that a man of science has to perform, that any association of names with results is possible. In all other and higher departments of knowledge, such as Newton with gravitation, &c., or, to exemplify from our own departments, Linnæus, Jussieu, Cuvier and Geoffroy, all these men are historically eminent for their labours far more than for attaching their names to the objects of their study. With such examples of high and honest effort, to be imitated by us in proportion to our respective abilities, it is surely an ignoble ambition, and certainly an uncommon one, that would aim at distinction by

* Canadian Ent. vol. vi. p. 203.

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having the name printed in association with a weed, or a bug, or a bone." *

Strict Priority cannot settle our Nomenclature.

It is contended that the strict application of "priority" will give us certainty in nomenclature. We shall see, I think, how this is.

Dr. Sharp, who (in the pamphlet already mentioned) concludes that "to abandon the rule of priority is to abandon the only foundation possible," has the following observations on "the very important point" whether a description applies to a species:—

"This is a very much more difficult problem than the ascertaining of a date, and it can only be properly dealt with by a complete consideration of the evidence in each particular case, and this evidence is of three kinds. 1st. The description itself and the complementary evidence accompanying it (such as locality of occurrence, statement of habit or peculiarity of modes of life, &c.); 2nd. Tradition; and 3rd. The existence of the individuals from which the description was drawn up, or of other individuals alleged to be authentically named. The evidence under the first of the heads is the most important, and if it be of itself satisfactory no other evidence is necessary; if the description accord satisfactorily with the characters of a particular species, and if it be ample and well-drawn up, and especially if it be accompanied with a well-executed figure, the question is decisively settled. But if the description be so deficient in any or all of these points as to leave doubt in the opinion of a skilled or expert inquirer into these matters, the evidence should be sought under the other heads. And if it be found that scientific treatises dealing with the matter have declared or cited the questioned description as belonging to some ascertained species, and if the number and importance of the treatises in which this is declared be considerable, then also this evidence is important. As for the evidence of types, it is clear that this must not be exclusively or even strongly relied on." †

And this is all! Those who expected, as I did, to derive assistance from Dr. Sharp's treatise must have felt no little

* I remarked (ante, p. xix), that in two noteworthy instances the claim of a "right" in the first nomenclature had been repudiated by those who yet favour absolute "priority." The writers referred to are Mr. Scudder and Dr. Sharp. The former writes (Am. Jo. Arts & Sc. 1872): "In systematic nomenclature the object is to register titles, not to gratify pride, and the names of authors are appended for convenience, not fame; the question of justice or injustice has no place here."

Dr. Sharp (in Nature, v., 341) lays down that the author's name placed after a species "should always be that of the first describer of the species; *not because he has any right in the matter*, but as an additional means of certainty, and as a security against change."

† Object and Method of Zoological Nomenclature, pp. 30, 31.

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disappointment, for he most serenely gives the go-by to all our difficulties. To all who know the subject (whether expert inquirers or otherwise) the remarks above quoted are harmless platitudes; and when they are read and agreed to, it seems to me that the case is left exactly as it was before. The descriptions of the old authors do not "accord satisfactorily with the characters of a particular species" and are not "ample,"—therefore they do not furnish material for Dr. Sharp's *decisive* settlement. Then the evidence is to be sought in tradition or types. Well, in the cases which make our difficulty, "scientific treatises, which have declared the questioned description to belong to an ascertained species," are either none at all or are *not* considerable in number and importance. As to types, Dr. Sharp agrees that "very little authority can be attached to them." Then, where does all this leave us? The evidence of which Dr. Sharp speaks is not forthcoming; and it is exactly because it is not possible to obtain such evidence that it is now discovered our nomenclature cannot be settled by recourse to the old descriptions. The above passage states simply enough the "priority" *modus operandi*. What has been lost sight of is the all-important fact that the method is inapplicable to the only cases on which our discussion turns. "Priority" is baffled by the old writers, and on that ground its virtues are a matter of pure indifference. What is the good of puffing an invention that cannot be got to work?

Discretion cannot settle Nomenclature, which requires a Rule.

M. Candèze, the president of the Entomological Society of Belgium (who is engaged on a monograph of the *Elateridæ*), has placed on record his views on the question, which closely resemble those contended for in the present paper. He remarks*:—

"To-day when entomologists are divided into two camps on the question, whether we are bound to return to the names which have been long forgotten, to substitute them for those which have usurped their place and which tradition has consecrated, or whether we ought not rather to admit for scientific names a sort of prescription legitimising these usurpations—in presence of this discussion in which both sides support their opinions by excellent arguments, I thought it necessary to take a part.

"An enemy of every exclusive and absolute rule, I have not rigorously followed either of the two systems, allowing myself to be guided by one or the other, according as it appeared to me the more rational in such and such a case. Thus, while for *Adelocera atomaria*, the name before admitted by me,

* Mon. Elater. quoted Ann. Soc. Ent. Belg. 1874; Comptes rendus, pp. 10, 11 (December, 1874).

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I adopt the correction which attaches to it the name *carbonaria*, which is older by some years, I reject that of *punctata*, which it is proposed to substitute for it as the most legitimate.

"I by no means ignore the criticisms to which I expose myself by acting in this manner, but I think that moderate minds will support me, and that sooner or later a sort of compromise will rally the greater number. . . . . I have always declared that if sometimes I range myself on the side of the reformers,' sometimes I abide with the 'conservators,' it has not been without reasons which I consider good."

In this passage we see the doctrine of "*Communis error facit jus*" carried into practice, and have a clear illustration of the way in which it is proposed to work the priority rule. *Atomaria* is the name in use in France, but *carbonaria*, the name in use in Germany, is older; therefore of course *carbonaria* supersedes *atomaria*. But *punctata* is older still. *Punctata* is nowhere in use, therefore *punctata* must be rejected; and we retain for the insect the name *carbonaria*, the oldest which is in use.

Thus M. Candèze treats this case as those who share my opinion would treat it. Acting on our principle he naturally arrives at our conclusion. My object, however, now is to carry this a step onward, and to show that the considerations which have conducted M. Candèze so far must take him farther.

We have seen that M. Candèze declines to bring forward a name for many years totally forgotten. He however says that we shall find him siding sometimes with the reformers and sometimes with those who are in favour of preserving the names, and on whichever side it is that he is found it will be "for reasons that he considers good." I hope not to be misunderstood in saying that I think this conclusion of M. Candèze cannot be justified. Nothing short of that declaration will serve, and it would be highly dangerous to be otherwise than explicit on the point.

What is it we are struggling to do? At the present time our nomenclature is shifting and uncertain, because successive authors change one after another the names that are in use. We are struggling to render our nomenclature certain; that is, to establish the names in such a manner that it shall no longer *be in the competence* of successive authors to change them. As the case at present stands the labour which A. has expended on a given identification is rendered worthless by the later labour of B. and C. Both of these again find their conclusion rejected because D. arrives at one that is different. Now *these* authors have determined the question by "reasons which they consider good." It is because what A. "considers" good, B. "considers" not good, that B. discards the conclusion that A. arrived at. It is because though he may consider that B.'s

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reason and C.'s reason "good," he yet "considers" another reason better, that D. in his turn declines to follow the conclusion of B. and C. Where perception is the only guide and standard, A., B. and C. may fairly differ, considering that the subject-matter is so obscure as we have seen that it is.

But it does not do to forget that we are concerned with not only the independent judgment but also with the preferences of individuals. There is scope in nomenclature for the operation of a writer's preferences; and sometimes all do not agree on the value of this or that author. There are list-editors* so possessed with the paramount importance of the Fabrician nomenclature that they are committed to supporting the Fabrician names, recognizable or unrecognizable, under all circumstances. There is another author who (as we have seen) has placed on record his conviction that it is necessary to neglect altogether the great majority of the Fabrician names in the group which he specially affects, because they are unrecognizable or are found to be only synonyms for names given before.

Now the reasons which have appeared "good" to one writer and not good to another have brought about contradictory results, though each writer has pursued his investigations subject to the direction of the same principle and the area for difference is restricted to one solitary point. It is while "priority" pure and simple receives the unsparing adhesion of those who publish lists, that the reasons which each considers "good" have landed us in confusion. But M. Candèze's proposal is very remarkable. The fact that good reasons send him sometimes to the side of the reformers and sometimes to the other side is used as an argument for throwing off the *single* controlling enactment which does now supply the essentials for an agreement; and this without putting anything in its place. Under this plan then the reasons which an author may consider "good" will be reasons for following priority or ignoring it, for rejecting the first name (of which M. Candèze has given us an instance), or insisting on it, and we must now take it that this prominent entomologist has declared himself free from the rule of priority as it at present stands. M. Candèze's system seems to leave us without anchor, chart or compass. Heretofore divergences in judgment have been restricted to *modus operandi*. Henceforward, all is to be discretionary. I dread to contemplate the condition at which, as it seems to me, our nomenclature will arrive in two years if such a principle receive acceptance. To institute a parallel which holds good in some respects,—it does happen that courts

* Amazing as this statement seems, it is unvarnished truth; see the preface to Gemminger and von Harold's Munich Catalogue, pp. x., xi. (See also Discussion of Priority, pp. 40—45.)

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of equal authority come occasionally to conflicting decisions; and that takes place in administering a fixed law when all which the judges have to do is apply it. But only conceive what condition of things we should come to if judges were to begin deciding upon rights by the light of discretion only, doing what they considered desirable and untrammelled by a positive law!

When M. Candèze has rejected a prior name on the ground that it has been long disused,—which he has shown us is a reason he considers "good," why should another author abstain from bringing that name forward, on the ground that it is the prior name—which is a reason he in turn considers "good"? This surely is the kind of decision which might properly be described by Dr. Sharp as one "to be reversed on the first appeal;" but Dr. Sharp's criticisms could not (from considerations of chronology) have had reference to M. Candèze's proposal. Bad as I consider the present practice has proved to be for our nomenclature, I think it is only as King Log to King Stork in comparison with the principle (for such only can it be termed) of having no rule but what the author chooses. We are in search of certainty in our nomenclature. How can it be said that rejecting or bringing up names on grounds of discretion will ever bring certainty?

I said that the line which M. Candèze adopts would take him further than the point which he reaches. It is impossible to stay where he leaves off; and I think the rest should naturally follow. If an author's object be sometimes to bring forward old names, and sometimes to reject them when there is *no* substantial difference in the circumstances, we must grant at once the proposition that rules for nomenclature would be out of place. But if, in bringing forward or rejecting the old names, the author acts upon a principle which admits of being stated, I cannot imagine in what respect his work is not greatly improved and advantaged by having the support of rules and reasons. It would appear to me that a compilation of synonymy not so supported remains open to be misread and misunderstood in every way, and that whenever its conclusions might be attacked the attacker would experience an easy victory, because no person could say on the author's behalf what his grounds of procedure or *modus operandi* were. If these considerations be well grounded, the old names, if they are to be rejected, must be rejected on a principle; and I do not gather from M. Candèze's observations that he entertains any rooted objections to the principle of discarding names totally disused.

Irreconcilable Confusion must continue to result from the present Condition of Things.

Mr. W. F. Kirby has contributed to the "Canadian Entomologist" (vol. vi. p. 196) a short but very important paper on

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"Discrepancies in Recent Lists of Lepidoptera," which is as follows:—

"The opponents of the law of priority in nomenclature have taken occasion, both in England and America, to argue against the restoration of obsolete names, on the ground that the names employed in my Catalogue of Diurnal Lepidoptera do not always harmonize with those used in Staudinger's Catalogue of European Lepidoptera. Although this argument looks plausible at first sight, a little reflection will probably convince many that it is baseless. We may leave genera out of the question now, as Staudinger has not attempted to grapple with the difficulties which they present; but as regards species, it must be remembered,—1st, that Staudinger starts from 1758, instead of 1767, and that I should have done the same had I investigated the question fully when I commenced my work; and 2nd, that Staudinger, working at European Lepidoptera only, was necessarily better acquainted with the special literature relating to them than myself. Had I selected 1758, and possessed Werneburg's "Beitrage zur Schmetterlingskunde" at the time I was writing my own Catalogue, or had Staudinger's new Catalogue been published in time for me to verify the references contained in it, I think I may say that many of the alleged discrepancies would have disappeared, although, in some cases, I may have made use of materials which Staudinger does not appear to have employed, or may have seen reason to disagree with him as to the determination of certain species. Unless two authors have exactly the same materials to work with, or one copies from the other, no rules will be sufficient to insure their absolute agreement in every case; but by the strict law of priority, the chances of disagreement are reduced to a minimum."

I presume I am to consider myself included in the description of "opponents of the law of priority." (The phrase is convenient as a *nomen triviale*, though it is defective as a *diagnosis*.) Now, I certainly have used the discrepancies in Kirby's and Staudinger's Catalogues as furnishing arguments against the endeavour to restore obsolete names founded by the early writers; and I have vouched them (with other considerations) as proving an important part of the case set up. I venture to think that if, on the appearance of the two Catalogues, I had missed drawing attention to the discrepancies as they exist, *and the causes of them*, I should have failed to seize what is really a plain conclusion; and also should have been rightly chargeable with building up a discussion of words and theories instead of dealing with facts. I repeat the expression of my opinion that the lessons to be drawn from Mr. Kirby's and Dr. Staudinger's Catalogues taken together are in the highest degree valuable; from the point of view therefore which I occupy, the remarks which Mr. Kirby may offer on the matter have a corresponding interest.

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First of all, it seems necessary to state that the ground taken up is something different from that which the words quoted would indicate. I do not think anybody has founded arguments on the bare circumstance that the names in the two Catalogues in question "do not always harmonize." For myself I never founded on that circumstance an argument of any sort or description; and the exploit would be so entirely futile that (in the absence of an allusion more definite) I think the words have not quite accurately expressed what Mr. Kirby probably intended.

I *have* pointed out that Mr. Kirby and Dr. Staudinger, "having in almost every instance used identically the same references," have, in what I term a prodigious number of cases, come to different interpretations of them. In particular, I have quoted a chain of instances where these two writers have sounded every note in the whole gamut, and not only "did not always harmonize," but did always arrive at discord; and on this circumstance (with others) I have argued that a large proportion of names in the old books are not truly recognizable, even after the maximum of research and study by two of the most industrious lepidopterists. *That* is the conclusion which I sought to impress upon entomologists interested in our nomenclature.

It would have been impossible for any one who had read Mr. Kirby's and Dr. Staudinger's prefaces to their respective Catalogues to found an argument (of the kind supposed) on the bare fact that Kirby's and Staudinger's names are different, because it was plainly stated that Staudinger had gone back for his names to the date 1758, while Kirby announced that he had adhered to the names of 1767.* If Mr. Kirby is under the impression that this circumstance was lost sight of, he must himself, I think, have given little attention to the criticisms which provoked his reply.

Mr. Kirby continues:—"Although this argument looks plausible at first sight a little reflection will probably convince many that it is baseless." The argument really used is, I venture to maintain more than plausible, for not a little reflection only, but a somewhat prolonged investigation has brought me at least to the conviction that it is well founded. Two years and more before Mr. Kirby put forward this explanation, I had pointed out that the differences between Staudinger's Catalogue and Kirby's Catalogue would be *wider than they are* if the two works agreed on their starting-point; and the matter received a great deal of notice in the pamphlet, entitled "A Discussion of the Law of

* I say it is "announced." It is, however, not always the fact. Instances will be found by every one who looks for them in which Mr. Kirby starts from 1761. It is unnecessary to complicate the discussion by enlarging on this circumstance.

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Priority," which I published. As I have no reason to alter the language, and the point is of the essence of the controversy, I may be forgiven for presenting the case in words then used. I said:*—"The cases in which Mr. Kirby and Dr. Staudinger now print different names for the same species do not by any means make up the total number of cases in which those two authors are opposed. Mr. Kirby restricts himself to 1767, and restores no names of earlier date; while Dr. Staudinger starts from 1758. Now Mr. Kirby, who does not use them, cites a prodigious number of "prior" names (given in his Catalogue as synonyms), which Dr. Staudinger does not recognize! The results are not yet felt; because, though he finds and identifies the names, Mr. Kirby at present refuses to restore them. When he shall publish a list starting from the date 1758 or 1746, there will be a terrible addition to the number of cases in which he and Dr. Staudinger are dragging us different ways."

And I gave this instance of the way in which the change of Mr. Kirby to 1758 would work:—"Dr. Staudinger acknowledges and restores names found in the Museum Ulricæ (1764); Mr. Kirby does not. If, therefore, 'Sibylla' be found described in the Mus. Ulr. (1764) under the name *Camilla*, Staudinger will accept this name, but Kirby will call the butterfly *Sibylla* still. Now Kirby goes to the Mus. Ulr., and there he does find 'Sibylla' described under the name *Camilla*. It is against his principle to take names earlier than 1767, so he does not change the name, but only quotes *Camilla* as a (prior) synonym. Staudinger, meanwhile, who would adopt the name *Camilla* from the Mus. Ulr. without hesitation, *fails to recognize* the species there at all! The consequence is that he likewise (in ignorance, or by choice) retains *Sibylla* as the first name. Now, supposing Kirby to be accurate, it is quite clear that Staudinger ought to have rejected the name *Sibylla*, L. S. N. (1767), for *Camilla*, L. M. L. U. (1764). When Mr. Kirby publishes a list beginning from 1758 or earlier, he will have 'Sibylla' under the name *Camilla*, and thus he and Dr. Staudinger will be openly at difference; they are now disagreed, though, under present conditions, the difference does no harm. It does not signify whether the former author be right, or the latter, or neither. The *disagreement* between them does the mischief; and, wide as that is now, it seems to be not nearly so wide as it will be when the works of both agree on their starting-point."

This was followed by a succession of instances (quotations and references being given) where Kirby and Staudinger came to different interpretations of a number of names all traditionally ascribed to various European butterflies with white-banded wings (which cannot be reproduced here); the summary

* Discussion of Priority, p. 21.

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being:—"'Sibylla' is *Camilla;* 'Camilla' is *Lucilla;* 'Lucilla' is *Sappho;* 'Sappho' is *Aceris.* 'Camilla' is *Sibylla;* 'Sibylla' is *Prorsa; Prorsa* is before the commencement of our nomenclature. The early nomenclature is an exhilarating study! There is not one of the books above quoted which was not already antiquated in the time of our grandfathers. . . . . This *farrago* of disagreement at present lies concealed from those who do not search for it. But for the circumstance that Mr. Kirby had (when he wrote his Catalogue) refused to go behind 1767, we should now be in the thick of the contentions I have just exposed, and hundreds of similar ones on questions of the same importance. *If* 'Camilla' be restored for our *Sibylla*, we have the whole avalanche upon us."

It is impossible in a paper such as this to do more than give instances to show how this change confuses the nomenclature of Kirby's Catalogue, and Staudinger's as well. Anyone can discover for himself a large collection of similar cases among the long-discovered species; and I must not delay over this portion of the subject.

I must maintain that the difference in the date taken for starting-point does not explain the existence of discrepancies between Kirby's list and Staudinger's; because, although it happens that Staudinger and Kirby do print different names because of the different starting-points which they accept, yet not only does that circumstance account for comparatively speaking a very small number of the discrepancies, but in point of fact there are so many obscure names in the books of 1758—1767 that the two authors' disagreements are largely increased in number when that period is taken into the account. We get a spice here of the "chaos" that writers on synonymy frequently mention. The period before and long after 1767 was the infancy of entomology, but before 1767 was certainly its toothless babyhood. The British Association Rules still forbid recourse to the names of that period; but the two active catalogue-writers on the *Lepidoptera* are now agreed in favour of taking 1758 as the starting-point. We are thus in the position, for the first time, of seeing what kind of names these are which have lain hid so long. I think there will not be much doubt in the mind of those who handle the question that the names prior to 1767 are of the strictest sect of the unrecognizables, and (as I have convinced myself by some very distasteful labour) that agreement in favour of using them will increase the confusion.

Mr. Kirby says:—"Had Staudinger's new Catalogue been published in time for me to verify the references contained in it, I think I may say that many of the alleged discrepancies would have disappeared."

I am puzzled by Mr. Kirby's use of the phrase "alleged discrepancies." If the discrepancies are alleged only, and not

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actual, it seems peculiar to excuse them on the ground of Staudinger's better acquaintance with the literature; while the drift of the passage would appear to be that a verification of Staudinger's references by Kirby would have effected the disappearance, not of discrepancies supposed or imagined to exist, but existing in fact. However, I do not take the phrase to imply a denial that the differences are actual and substantial, because, in truth, such a contention could not be raised by anyone acquainted with the two works. Staudinger (says Mr. Kirby) was better acquainted with the special literature, and had Kirby verified Staudinger's references we should not be complaining as we are. It is invidious to look gift-horses in the mouth, and the explanation which an author may choose to furnish to critics is a gift-horse to some extent. If, however, we contemplate using the animal for stud purposes, it may be that the character of our stable for years to come will depend on its strength and soundness, and a prudent man will pocket proverbial philosophy and send for the veterinary surgeon. The works, then, which Dr. Staudinger cites—which Mr. Kirby does not cite, and which may contain identifications of "Diurnal Lepidoptera,"—do not exceed thirty in number, all told, and by far the greater part of these appear to be works of a completely trivial character,—such, for instance, as may be used for the localities in Staudinger's Catalogue, but of which he appears (though he gives them in his list of authors) to have *ignored* almost the whole number in the synonymy. In point of fact, I do not assert that these works may not here and there be responsible for differences, but the number which is thus accounted for is again insignificant so far as my researches have gone.

An odd thing about Mr. Kirby's explanation is, that in another way it does not meet the complaint. The "better acquaintance" with the literature, so far as making use of *a far greater part* of it is an indication, is shown on the part of Mr. Kirby. He has identified numbers of references which Dr. Staudinger has passed by, or (according to his own remark) has "made use of materials which Staudinger has *not* employed." Though in the majority of cases the same references have been made by both authors, and very often differently construed, yet there is no room for doubt who makes most use of the literature—that is Mr. Kirby himself, and not Dr. Staudinger.

Mr. Kirby further says that had he possessed Werneburg's "Beitrage zur Schmetterlingskunde" at the time he was writing his Catalogue, or had Staudinger's new* Catalogue been published, he "thinks he may say" many of the discrepancies

* It is worth remarking that Mr. Kirby did start on the same general lines as Dr. Staudinger. In 1862 Mr. Kirby published a Manual of European Butterflies, which he prepared when enjoying "unusual facilities for studying the literature of Entomology," but he actually based that

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would not have appeared. This, I presume, means that Mr. Kirby has made errors in his identifications, and has that brought home to him when he finds that another has decided differently. This is not in any way a pleasant discovery. The superseding of names in use by others, which are abandoned when a fresh author says something different, is the very practice which has proved so serious for our nomenclature; and it is to be regretted that heretofore this occurrence has been treated so much as a matter of course. One author thinks he sees a likeness in an old description, and brings it out as identified. Three months after (it may be) some one else sees a better likeness, and that is brought out in its turn, to serve till something more attractive still is lighted on.

We have quitted the subject of the old descriptions, but perhaps it is as well to look again at them from this new point of view. What light does *all this* throw on the character of the descriptions which admit of such conflicting interpretations? We have modern author after modern author (not at all ignorant, but on the contrary, having trained himself for this special work) finding grounds for bringing out new identifications. Yet the grounds which they make sufficient for upsetting names in use are so little worth, that they are ready at the shortest notice to withdraw their identifications in favour of a new one. The reason is this, the books *do not furnish* any good grounds. I do not believe Mr. Kirby has identified any species *dissimilar* from the description. If he had done that, it would be a far different affair; but, on the contrary, I take it that Mr. Kirby had fair grounds for his identifications and read the descriptions as well, on the whole, as they truly admitted of being read. Both authors have reasons of some sort, but nearly all is mere speculation. The difficulty being caused by facts (not rules, or theories), such disagreements must continually crop up, and there is no possible way of reconciling them, while recourse to the old descriptions is permitted.

As to placing justly any reliance on Herr Werneburg, or vouching him as an authority in disputed cases, surely this is not to be entertained. Herr Werneburg has devoted himself to this study, and is responsible for a number of our irreconcilable differences; but as for Herr Werneburg's work bringing us to *certainty*, it is almost a shock to hear the suggestion made. Dr. Speyer long ago* characterized Herr Werneburg's work as having taken from "the generally unintelligible and vague descriptions and defective plates of the Patres Entomologiæ, identifications which hung on the most precarious holding

work on Staudinger's first Catalogue (1861), as will be found stated in the Appendix (p. 145). Mr. Kirby was not working solely by the light of nature, for he and Staudinger were starting fair in 1862; and of all Staudinger's references up to that point Kirby had the use and advantage.

* Stett. Ent. Zeitung, 1865—66, p. 51.

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points," and Herr Werneburg's Beitrage must be considered —not a repertory of truths (as I am submitting), but an assortment of speculations—like the parts of which we complain of the two Catalogues themselves.

Before leaving Mr. Kirby, let us take a new look at certain facts. Mr. Kirby gives the explanations which have been quoted, to account for his differences from Staudinger. We will take a familiar instance, the one originally used by me three years ago,* and test these explanations. Kirby and Staudinger's Catalogues (as they stand) differ on the names of *one-seventh* of the British *Rhopalocera*. Since reading Mr. Kirby's explanation (which appeared to hold out hopes that the differences could be reconciled), I have gone through the synonymy again, and have to report that whereas, starting from different dates, Kirby and Staudinger differed in one-seventh, now that they both start from 1758 (taking also into account some fresh identifications by Mr. Kirby), the differences have risen to *one-sixth* of the number. When the two lists first appeared, they changed seventeen of our species' names; some additions to the "corrections" having been made, now they change twenty. The common starting-point of 1758 has not reduced the number of these differences, but added to them; and the fact will have interest for British entomologists, who would have been truly glad to see a real explanation forthcoming. As for the other reasons, in nearly all the cases of difference Kirby and Staudinger have had the same materials and made the same reference to page and plate. But where more "literature" is quoted, it is almost always quoted by Mr. Kirby himself.

I conclude that it will be self-deception on our part if we expect a reconciliation of the names, unless one author makes a simple surrender of his opinions, retiring in favour of his rival in cases where they differ. Even that step would be eventually ineffectual, for the next list-writer may be relied on to ferret out such points again.

The foregoing remarks have been directed to exposing existing evils and considering some opinions of entomologists. Therefore, whatever proposal I may found on them (and whether the expedient which I am about to suggest receive approval or disapproval), the points already dealt with will remain unaffected.

There is a Remedy in a Rule which does equal Justice.

With this preface I proceed to indicate the reform which I look for.

The object is to exclude the names which cause confusion—that is, the names which are attached to descriptions doubtfully

* Discussion of Priority, &c., p. 83.

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recognizable. The descriptions doubtfully recognizable are found in the old books. Therefore any expedient which excludes recourse to the old books effects the object.

The object also is to preserve the names which are everywhere in use. Any expedient, which protects the names in use, *ex vi termini* excludes doubtful names brought up from the old books.

The objects are clear—(1) to exclude doubtful names; (2) to preserve accepted names. They are not identical, but both objects can and must be pursued together.

It has been several times suggested that the enjoyment of universal acceptance for a period of years should give a name an indefeasible title to adoption. For a purpose which I have in view, I will fill in the number "thirty" and make the proposal read thus: No name for thirty years in universal acceptance should be displaced.

We have seen that an objection which we had to meet was founded on the claim for justice to predecessors. A part of our reply was that the "justice" demanded was demanded under *ex post facto* legislation—the "rights" being laid claim to under a retrospective construction of the law.

If that answer recommends itself, then we advance a step. No rights can justly be claimed under a retrospective construction. Act on that. Deny to the law any retrospective operation. See now whether we are not rewarded for consistent conduct by seeing our difficulties disappear.

The date of the law is 1842, a year which is a good way on the right side of the "infancy of science" period, to which we owe our troubles. No name before 1842 can lay claim to priority as a right.

This would be the working of the limitation. No name could be produced now for the first time from any book bearing date 1842 or previously. Place together by themselves, labelled "Old Style," all books of that period, and agree that they be considered as non-existent so far as new identifications are concerned. That stops the evil spreading henceforward. No author can then bring up a name from Old Style books, unless the name has been kept alive by quotation as the true name in some work since 1842. Here is a measure there is really no difficulty in applying, and its operation is simple.

Merely being quoted in the synonymy since 1842 will not do. Nearly all these names which afflict us (now brought forward as the true names) have for years past appeared in the synonymy as representing some species in some author. If that were allowed to give the old name a claim to be received, we should reap little benefit from the change.

This limitation agrees well with the proposal already mentioned, which has attracted much popularity. The names which have appeared as the true names in publications since 1842 fall

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into one of two categories; either they are in universal employ themselves, or, at all events, they prevent any other name having the title of universal employ. I took the period of thirty years for the prescriptive right. The date 1842 is thirty years exactly from the date (1872) when this limitation was proposed, and both plans are thus made to come to the same thing. If a name found in a publication since 1842 be the name given as the true name in all publications, it is in universal employ. Good; it cannot be disturbed. But if in *any* publication since 1842 a name is given as the true name, then it follows that *no other* name is in universal employ. Therefore, the names which (in the phrase of a great French entomologist) "usage has consecrated" are effectually preserved by both methods. On the other hand, where *no* usage has "consecrated" the names, our principle does not intervene. Thus both plans are applicable or inapplicable together.

Suppose a question arises as to the true name of any species. The choice at present lies among all the names in all the books there are. Henceforward, it will lie only among names which since 1842 have been treated as the true names; and we have the difficulty confined within reasonable limits. It does not become impossible to find cases of sickness, but the plague is stayed. There could be no difficulty in agreeing what work is the true starting-point in the case of each Order; and operations in synonymy would soon fall into mere routine.

Here then, as I submit, we find a point where the ground of "universal employ" and the ground of logical deduction are conterminous,—at which we can unite the suffrages of two schools of doctrine; and it is so fenced around by a principle, that "the man of science" can occupy it to his advantage.

Having defined the proposal in a few words, I have to say something more about it.

There is a natural indisposition to make a sweeping limitation which may seem to serve out hard measure to the good descriptions, while it aims only at protecting us from the bad. It may be said by some who are far from unfriendly to the movement, "Suppose an unmistakably 'prior' name is discovered to-morrow in an ancient work, will you not consent to its being brought up to supersede names in use?" That is a question which deserves an answer; and it shall have the best which I can give.

There is no such thing as a category of plain cases; nor can there be one law for dealing with plain cases and another for obscure cases. Directly you admit of such a difference, see what you open the door to. Who is to decide what is a plain case, and what an obscure one? When one writer proposes to pass by an old name on the ground that it is not a plain case, another may insist in bringing it forward on the ground that

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it is a plain case. Where are we then? Why, exactly where we are now; that is, depending altogether on the judgment of authors—on points where judgments cannot be made to agree. Any change of the law which provided different treatment for so-called "clear cases" would leave open the door to all the evils which we are suffering from now. Such an alteration (as I have argued in considering the proposal of M. Candèze) would be illusory altogether; and, however unwelcome in one of its aspects the scheme may be, yet it would be the worst mistake to shrink from saying that nothing but a fixed limit for admission—which involves a fixed limit of exclusion—can succeed.

But although the scheme may appear rigorous, in point of fact its operation is perfectly harmless. There are no "clear" cases, such as excite sympathy, to be brought forward; and this is the best answer to the question. Preceding list-makers and monographers have, in one work or another, brought up the "clearly" prior names and they have been already admitted; those we are now receiving are not the clear but anything but the clear instances. For the sake of uniformity (and indeed to prevent its whole object being frustrated) the rule must apply to all names, but no one need experience alarm that "clear" priority will suffer by it.

If, after all that can be said, the proposal of the date 1842 appears to those who weigh the reasons to be too sweeping, then by all means let us agree on some date farther back. I have said why I prefer the starting-point of 1842, but agreement can do anything, and I should eagerly co-operate in fixing even* 1800 as the limit. Those who agree with me in *the objects* desired, will, I think, if they give attention to the matter, bring themselves to a conclusion upon *the method* not essentially very different from the one I have expressed. This reform could only be wrought by agreement; and when those concerned meet together to form an agreement, the general plan would be found to admit of moulding this way or that, according as those who assisted might decide.

We are occasionally told that we cannot enforce performance of a rule; but I think this difficulty is somewhat of a bug-bear. The list-makers do not agree on the names they introduce; and the authority of any particular one, as well as of all together, is in a great degree neutralized by that circumstance. Then, when once we are entitled to retain the names in use I think that there will be little disposition to bring out the forgotten names—that is, I confess I think that the agreement of

* In that case it would be necessary to draw up an "Index expurgatorius" of the works to which no recourse for new identifications could be had, as the dates of a few bordering on the line of limitation cannot be clearly ascertained.

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entomologists will have in a very great measure the effect of stopping that which it aims at stopping. But, supposing that it fails in securing this, it will be effective in another way. It will give us the right to disregard strange names hereafter to be brought up; and, considering that the law will be passed to supply a great need and to remedy evils whose pressure is as a fact severely felt, those who reap the benefit of it may be relied on to give it sturdy support. What reason is there to fear that, when they have a real boon of this kind granted them, people will be found renouncing it and submitting to the old disagreeables? At present we are without a lawful standpoint; and I admit that we are made to feel it. While, in answer to arguments, it can still be trumpeted that the "laws of priority" are all in all, it is the case that there is a real difficulty in declining to receive these forgotten names. But when the new law is passed, the whole advantage is the other way. Every sanction which can now be laid claim to by those who support the innovations will then be the warrant for their rejection, and it appears to me that there will be little to fear from those who might insist on continuing their resurrectionary exercises. At all events we have begged this question. We *now* proceed on the basis that laws are obligatory; and the British Association Rules and the Dresden Code bear testimony to the fact. We should be acting strangely if we forbore to alter the old law which is enforced to oppress us, for fear of not being able to enforce the new law which is to release us.

Summary of the Points contended for.

I conclude, then, that the rule of priority, as originally enacted in 1842, means that the earliest of the names in use should be adopted; or, at all events, that the consideration that the oldest name might have fallen out of use was not present to the minds of those who made the rule. That since then the circumstances are changed, and cogent reasons for resettling the law have become operative. That the paramount principle in nomenclature is convenience; and that, if all agree to forget a name, there is no "error" in the case, but right is done. That convenience requires the upholding of accord, if that can be done in a manner to render the accord permanent. That the bare rule of priority has failed to supply us with permanent accord (*i. e.* certainty), because it is not possible to decide on the earliest descriptions.

That, in order to make accord permanent, a law is necessary; and that discretion cannot effect any good. That accord can only be upheld by a law excluding recourse to the old books; and that law may take any formal shape so that its provisions be definite. That a law denying to the rule of priority any retrospective operation will exclude recourse to the old books,

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and will thus make accord permanent, while it will admit of justification upon principle. And that a law which proves in truth salutary will run little danger of being disregarded.

I have sought to show that Mr. Kirby's explanations of the discrepancies between his Catalogue and Dr. Staudinger's do not encourage us to expect an effectual reconciliation of them; and to point out that M. Candèze's proposal will not improve our present position.

I have said little of the discordant rules and practice adopted by different writers on synonymy because this paper is too long. Some, who seem to say it is necessary to identify the unrecognizable and interpret the unintelligible, have surrounded themselves with rules of their own private devising which, as might have been foretold, fail altogether to save them from disagreement, but, on the contrary, supply fresh points of difference. The identity of an insect with an old description is entirely or in part matter of tradition and not of proof. In that state of things we find some (like von Harold) avowing candidly that they accept tradition as all in all, while others (like Staudinger) profess that they decline to act save on "proofs which appear irrefragable," but that certainty cannot be attained; while the point to which another (Kirby, as we have noticed) brings himself is that there is "reason to disagree on the identification of certain species," and "no rules will be sufficient to ensure absolute agreement in every case." But I say "Remove the cause and the effects will disappear!" No rules which encourage and render obligatory a scrutiny of the worthless descriptions will ever produce agreement; but *other* rules can and will yet effect it.

Conclusion.

Confusion in nomenclature is not a visitation of Providence—inexplicable, and to be submitted to with folded hands. You would almost gather from some things said about it, that a mysterious calamity had fallen from the skies, which all were helpless to remedy. On the contrary, it is the most commonplace result of human agencies—and human agencies of a not very inscrutable or venerable description. Surely we are not going to be so supine as to suffer endless inconveniences for want of a resolve to avail ourselves of the expedients which are at hand. When thirty years ago the entomologists found themselves in trouble about their nomenclature, they made a rule to help them, and got straight again. Are we not going to do the same? A grave responsibility will, it seems to me, rest on those who do not bear a part in effecting some settlement. If the blow be not struck now, our nomenclature will

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fall a sacrifice; for we have seen what is coming, and in a brief space of time we shall have lost our opportunity for good.

The rule of priority was first enacted in this country. The movement we are considering originated at a meeting, nearly four years ago, of this Society. The approval which some sentences of my own were fortunate enough to attract led to the proposal being developed and supported by reasons given at length. Some discussion followed; and that was in turn succeeded by the signature, by an imposing number of our body, of a protest having for its object the suppression of the new names introduced. The movement is to a great extent the child of this Society; and I was anxious at this critical time to bring it again before those with whose support it has sprung onwards as it has. I hope enough *vis* remains to carry the movement forward to the end, that it may be not merely a welcome proposal, but also an effectual success.

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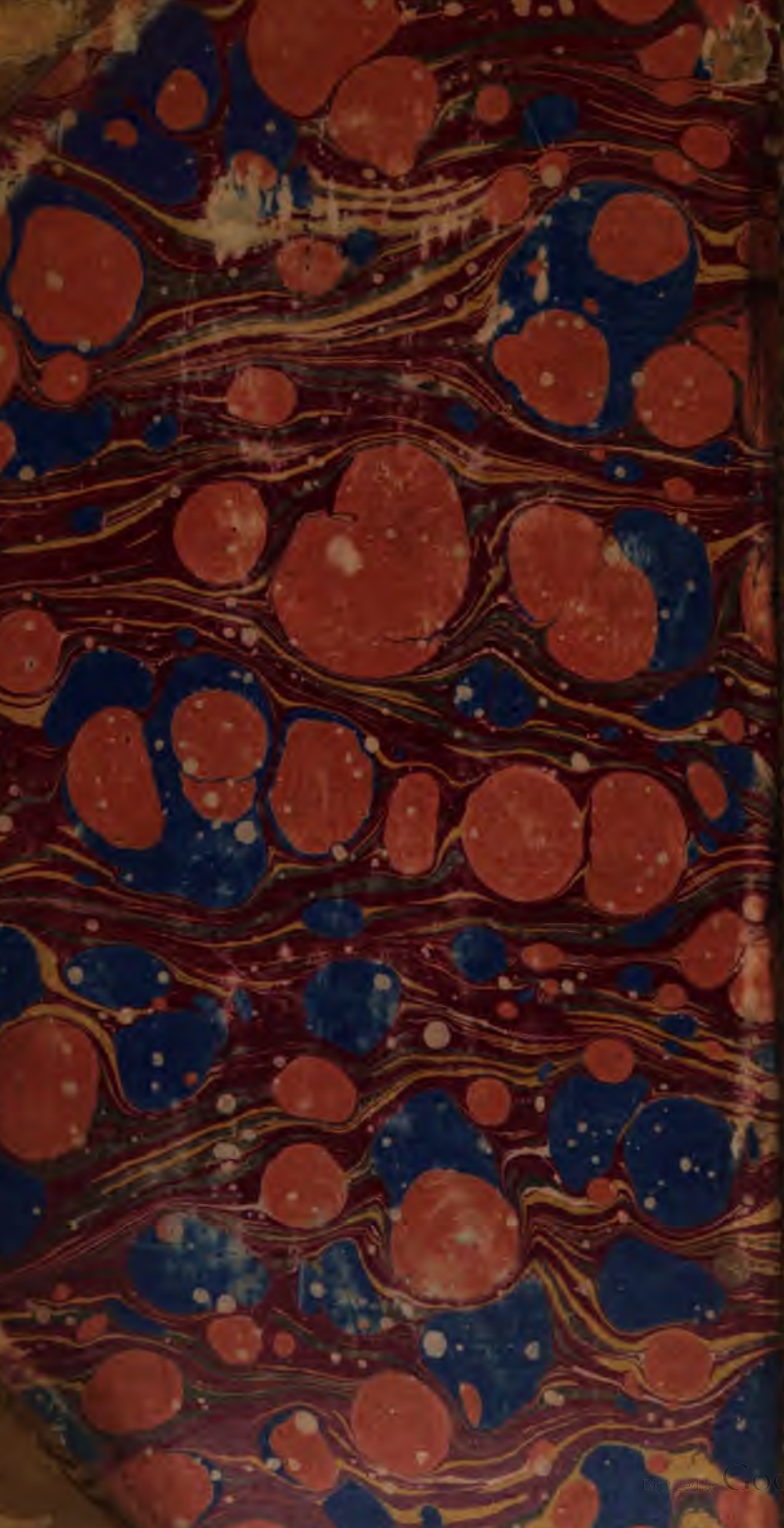
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